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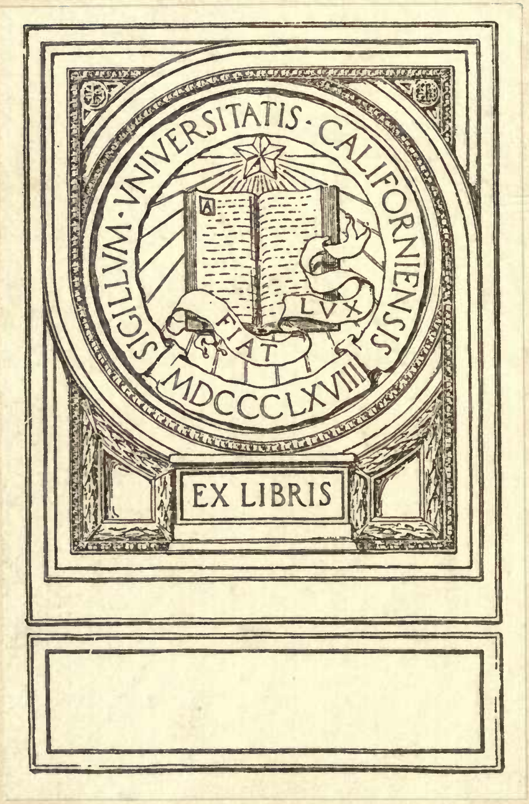

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A HIND
IN RICHMOND PARK

"There is a magic in Mr. Hudson's style and in his exquisite sensibility which awakens in his reader a thousand sleeping memories."

The Morning Post.

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A HIND
IN
RICHMOND PARK

BY

W. H. HUDSON

MCMXXII
LONDON & TORONTO
J. M. DENT & SONS LTD.

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PUBLISHER'S NOTE

This book contains the last words of the great naturalist who through the power of his love reveals the beauty of things animate and inanimate in the world in which he lived such a long, full, ecstatic life, in spite of the sadness and loneliness that were always his.

The publishers, who have enjoyed his friendship for many years, would wish to join with those who knew the man and his work in offering homage to his memory. "He fell on sleep," August 18th, 1922.

The author before his death handed to us the full manuscript of the book with the exception of the last chapter, which he said wanted a little revision. Part of this was in clear typescript, but the last few pages, amounting to some two thousand words, were in his handwriting and exceedingly difficult to decipher. We wish to put on record our thanks to his old friend Mr. Morley Roberts for the loving, patient care which he gave to the work of interpretation, in which he has succeeded in making plain the closing pages of the book, and also to Mr. Charles Lee for his valuable assistance in seeing the book through the press.

PREFATORY NOTE

The day before his death, Hudson told me that the last part of this book's final chapter was practically finished. All that was needed by the fragmentary script then lying scattered on his table was the thorough revision his work invariably received. When I offered to have it typed, he said that no one could understand it but himself. This I took to refer to his handwriting, which at its best was at times difficult, even to one who had known it for forty years. He often scribbled so illegibly in pencil on odd pieces of paper that he was occasionally hard pressed to read what he had written. As the book remained incomplete, it was necessary for someone to put the last words into order, and the task fell to me since I was familiar with his themes and had discussed them in letters and in talk. He wrote to me on the 2nd August of this year, " I did not want to add anything to the book, but it appears I must do it . . . and so I have had to go into the infernal question of the meaning of art generally—its origin and meaning. . . . And as soon as I get it done I want to send a copy for you to read—not for you to tell me to modify anything, but to see that I make myself understood." I quote this, as I could quote other letters, to show why it lay upon me to undertake a laborious and very painful task. But, when I came to examine the incomplete script, the whole of it proved so difficult that many pages took days to interpret, and perhaps one-third were wholly indecipherable. I have therefore been obliged to divine, by the "suggestion of contiguity" to which Hudson so often refers, the place of each paragraph and sometimes that of separate significant sentences. My impression now is that the main argument runs clearly enough, for many of the little portions omitted had in them an intelligible line or two which showed that they did but contain additional illustrative reasoning, not necessary matter. I need scarcely say that I have added not a word and have omitted nothing which could find a logical place.

MORLEY ROBERTS.

October 1922.

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A HIND IN RICHMOND PARK

I

Richmond Park—Red deer—An adventure with a hind eating acorns—Watching a listening hind—Senses in dog and deer compared—Senses and instinct in wild and domestic animals—Man and beast compared—The hind divides her listening sense in two parts—The trumpet ear and the ear trumpet—Strange case of a deaf lady listening through an ear trumpet to a sermon.

OCCASIONALLY when in London I visit Richmond Park to refresh myself with its woods and waters abounding in wild life, and its wide stretches of grass and bracken. It is the bird life that attracts me most, for it is a varied one although so near to the metropolis, and there are here at least two of England's few remaining great birds—the great crested grebe and the heron. The mammals are of less account, but I have met here with at least two adventures with the red deer which are worth recording. Stags are aloof and dignified, if not hostile in their manner, which prevents one from becoming intimate with them. When walking alone late on a misty October or November evening I listen to their roaring and restrain my curiosity. A strange and formidable sound! Is it a love-chant or a battle-cry?

I give it up, and thinking of something easier to understand quietly pursue my way to the exit.

One afternoon in late summer I was walking with three ladies among the scattered oak trees near the Pen Ponds when we saw a hind, a big beautiful beast, rearing up in her efforts to reach the fully ripe acorns, and on my plucking a few and holding them out to her, she came readily to take them from my hand. She invariably took the acorn with a sudden violent jerk; not that she was alarmed or suspicious, but simply because it was the only way known to a hind to take an acorn from the branch to which it is attached with a very tough stem. To her mind the acorn had to be wrenched from me. My friends also gave her acorns, and she greedily devoured them all and still asked for more.

And while we were amusing ourselves in this way, two ladies accompanied by a little girl of about eight or nine came up and looked on with delight at our doings. Presently the little girl cried out, "Oh, mother, may I give it an acorn?" And the mother said "No." But I said, "Oh, yes, come along and take this one and hold it out to the deer." She took it from me gladly and held it out as directed. Then a sudden change came over the temper of the animal; instead of taking it readily she drew back, looking startled and angry; then slowly, as if suspiciously, approached the child and took the acorn, and almost at the same instant sprang clear over the child's head, and on coming down on the other side, struck violently out with her hind feet. One hoof grazed her cheek and dealt her a sharp blow on the shoulder. Then it trotted away, leaving the child screaming and sobbing with pain and fright.

For a few minutes I was amazed at this action of the hind, then I noticed for the first time that the child was wearing a bright red jacket. O unseeing fool that I am, exclaimed I to myself, not to have noticed that red jacket in time! I think my hurt was as great as that of the child, who recovered presently and was duly (and quite unnecessarily) warned by her mother to feed no more deer.

I have seen the effect of scarlet on various other animals, but never before on deer. It affects animals as a warning or a challenge, according to their disposition, and if they are of a fiery or savage temper, it is apt to put them in a rage.

In the other adventure with a hind there was no sensational or surprising element, but it interested me even more than the first.

Seeing a hind lying under an oak tree, chewing her cud, I drew quietly towards her and sat down at the roots of another tree about twenty yards from her. She was not disturbed at my approach, and as soon as I had settled quietly down the suspended vigorous cud-chewing was resumed, and her ears, which had risen up and then were thrown backwards, were directed forwards towards a wood about two hundred yards away. I was directly behind her, so that with her head in a horizontal position and the large ears above the eyes, she could not see me at all. She was not concerned about me—she was wholly occupied with the wood and the sounds that came to her from it, which my less acute hearing failed to catch, although the wind blew from the wood to us.

Undoubtedly the sounds she was listening to were important or interesting to her. On putting my binocular on her so as to bring her within a yard of my vision, I could see that there was a constant succession of small movements which told their tale—a sudden suspension of the cud-chewing, a stiffening of the forward-pointing ears, or a slight change in their direction; little tremors that passed over the whole body, alternately lifting and depressing the hairs of the back—which all went to show that she was experiencing a continual succession of little thrills. And the sounds that caused them were no doubt just those which we may hear any summer day in any thick wood with an undergrowth—the snapping of a twig, the rustle of leaves, the pink-pink of a startled chaffinch, the chuckle of a blackbird, or sharp little quivering alarm-notes of robin or wren, and twenty besides.

It was evident that the deer could not see anything except just what I saw—the close wood a couple of hundred yards away from us on the other side of a grassy expanse; nor did she require to see anything; she was living in and knew the exact meaning of each and every sound. She was like the dog as we are accustomed to see it in repose, sitting or lying down, with chin on paws, seemingly dozing, but awake in a world of its own, as we may note by the perpetual twitching of the nose. He is receiving a constant succession of messages, and albeit some are cryptic, ? they mostly tell him something he understands and takes a keen interest in. And they all come to him by one avenue—that of smell; for when we look closely at him we see that his eyes, often half-closed and blinking, have that appearance of blindness or of not seeing consciously which is familiar to us in a man whose sight is turned inwards, who is thinking and is so absorbed in his thoughts that the visible world becomes invisible to him. The dimmed eye in the reposing dog and the absent-minded philosopher is in both cases due to the fact that vision is not wanted for the time, and has been put aside. The resting, but wakeful, deer and dog differ only in this, that the first is living in a bath of vibrations, the other of emanations. ?

To return to our listening hind. The sounds that held her attention were inaudible to me, but I dare say that a primitive man or pure savage who had existed all his life in a state of nature in a woodland district would have been able to hear them, although not so well as the hind on account of the difference in the structure of the outer ear in the two species. But what significance could these same little woodland sounds have in the life of this creature in its present guarded, semi-domestic condition—the condition in which the herd has existed for generations? It is nothing but a survival—the perpetual alertness and acute senses of the wild animal, which are no longer necessary, but are still active and shining, not dimmed or rusted or obsolete as in our domestic cattle, which have been guarded by man since Neolithic times. But as I have seen on the Argentine pampas, these qualities and instincts, dormant for thousands of years, revive and recover their old power when cattle are allowed to run wild and have to protect themselves from their enemies.

A life-long intimacy with animals has got me out of the common notion that they are automata with a slight infusion of intelligence in their composition. The mind in beast and bird, as in man, is the main thing. Man has progressed mentally so far that, looking back at the other creatures, they appear practically mindless to him. Their actions, for example, are instinctive, whereas in the case of man reason has taken the place of instinct. How funny it is to find these hard and fast lines still set down by some modern biologists! Alfred Russel Wallace maintained that there were no instincts in man. The simple truth of the matter is that our instincts have been more modified and obscured, as instincts, in us than in the lower animals. But though the instincts of animals are less modified and obscured, they are also interwoven and shot through or saturated with intelligence. In what do the ordinary occupations of hunting, fishing, shelter-building, rearing and protecting the young, and so on, differ in the animal and the savage or primitive man? There is mind-stuff, or, let us say, intelligence in both; neither beast nor man could exist without that element, although no doubt the man in a state of nature has somewhat more of it than his four-footed neighbours.

My only reason for touching on this question is that I want to say that I recognise a mind-life in animals similar to, though much lower in degree than, that of man. And the subject was suggested by the behaviour of the hind during the whole time, which was not far short of an hour, while I sat there intently watching her with interest and with surprise as well. And the surprise was at the intense interest she, on her part, was taking in the little sounds coming to her from the wood. These sounds, as we have seen, were of no import in the creature's life. It can even be said or supposed that she knew they were without significance, since there was no fear of any danger from that direction; and so wholly free from fear was she that even my presence at the tree's root behind her was disregarded. Surely thus in her listening she was experiencing a sort of mind-life, amusing herself, we might say, in capturing and identifying the series of slight sounds floating to her. Or one might compare the animal in that state in which I watched her, resting after feeding, chewing the cud, and at the same time agreeably occupied in listening to the little woodland sounds, to the man who, after dining well, smokes his cigar in his easy-chair and amuses his mind at the same time with a book—a fascinating story, let us say, of old unhappy things and battles long ago.

The last paragraph is pure speculation, and if any sober-minded naturalist (and they are practically all that) has already said in reading it, "You are going too far," I agree with him. The poet Donne has said that there are times when we, or some of us, think with our bodies, and it is truer of the lower animals than of us, perhaps; but the small outward manifestations are not enough to show us the mind, and the gentleman in his easy-chair, smoking his postprandial cigar and enjoying his novel at the same time, may be on a very different plane from the deer chewing its cud and catching little flying sounds in its trumpet ears, or from the dog dozing in the sunshine and capturing winged scents, even as the garden spider while peacefully reposing captures small gilded flies in her geometric web.

But what follows is plain fact. This same hind gave me yet another surprise before I had finished with her.

After sitting there for a space of fifteen or twenty minutes, sufficiently entertained by watching all those minute motions I have described, it came into my head to try a little experiment, and I emitted a low whistle. Instantly the ears, which had been pointed forward all the time, were thrown back, and remained in that position about a minute; then, no further sound being given, they went forward again. Then the whistle was repeated, and the ears came back and remained a longer interval, but finally went forward again; and the whistle and movement of the ears was repeated five or six times. Then came the surprise. When I whistled next time one ear was laid back while the other continued pointing forward at the wood. It was as if the hind had said —for she no doubt knew the whistling came from me—"I'm not going to be cheated out of my woodland sounds any more; I shall keep on attending to them and at the same time keep one ear on you to find out what this whistling means."

The surprise was that she was able to do such a thing. I had not known that an animal with trumpet ears could use them in that way, receiving impressions from two sources, taken in and judged separately and simultaneously, as a bird receives sight-impressions through the eyes placed (as in most birds) at the sides of the head, each with its own distinct field of vision. Or as the chameleon, with eyes mounted on rods, is able to keep one eye on the movements of an insect in its neighbourhood, while the other looks at you or at some other object which attracts its attention.

I soon found that if I refused to whistle as long as an ear pointed back at me, it would at last go forward once more to assist the other, and when this happened, and I then whistled again, the one ear—always the left ear—was instantly thrown back again, the other always keeping steadily on the wood.

This went on until the hind got up, shook the dust and dead leaves off, and slowly sauntered away without even a parting look at the person who had interfered with her pleasure by behaving in that eccentric manner. But she had taught me a lot. Did the hind, I wonder, with its beautiful trumpet ears, suggest the ear trumpet? Watching how this deer moved her pair of live trumpets about to catch passing sounds, it amused me to recall an old lady I used to see in a Hampshire village church who sat in a pew before mine during the Sunday morning services, and the deft way in which she manipulated her trumpet to capture the preacher's precious winged words. His manner in preaching was curious, if not quite unique. He would begin each sentence in a quiet natural tone, then raise his voice, then higher still, then let it drop back to the opening tone. Thus there were four changes in tone fitted to the four clauses composing each sentence, and there were also four bodily attitudes and movements to correspond. Thus, the first clause was delivered standing in a stooping attitude, the eyes fixed on the MS. In the second he rose to his full height and fixed his eyes on his congregation. In the third the upward movement culminated in the preacher standing up on his toes, supporting himself by placing his finger-tips on the pulpit, and then having launched the words of clause three in his most powerful tones, he would sink back to the lower attitude, downward bent eyes and low voice. The difference in the man's height when he delivered clauses three and four must have been about nine inches, which would of course make a very great difference in listening to the sermon by a person hard of hearing. There the old lady's ear trumpet came in; there were four changes in its direction for each sentence, from the first and last when it was directed straight before her, to the second and third when it rose, automatically as it seemed, and at the third it would appear like a crest above her head.

I was told, if I remember rightly, that he had been vicar above a quarter of a century, and had always preached just in that way, and that the old lady had attended the church for many years with her ear trumpet, till long practice had made her so perfect in its use in following the sermon through all the preacher's bobbings up and down, she could almost do it with her eyes shut and never miss a word.

II

Ears in man and other animals—Ears in primitive man—Atavism in ears, in the twitching-muscle and the teeth—Teeth-gnashing faculty—The teeth as a musical instrument—Cave men's chamber music—A natural ear-pad—Helping our ears—Wind-made noises in our ears a defect—A wind symphony.

THE subject of the hind and her ears set me thinking about the outer ears in man, and how they compare with those of other mammals, especially with the trumpet ear.

The ears in primitive men were free-hinged, not nailed to the head—but never so free as in the deer, horse, and many other animals, which are able to point forwards, backwards, and sideways. They were built on a different principle, though it may puzzle us to know why a long narrow head as in the horse, or a broad head as in foxes and others, should have ears placed like pinnacles on the top, while man's are against the sides of the head. One can only say that it is so because they grew so, or they happened by chance to come in that position.

The ears in early man were also undoubtedly very much bigger than ours; and by ours I mean the ears of the refined, cultivated races of man—the higher classes, who with the little "shell-like" ears flat against the head always exist side by side with those of a less improved type who have big ears standing out, and their correlatives, big hands and feet. I dare say the Palæolithic man's auricle was about the bigness of a tea-cup half-saucer, and being hinged, it could lie back flat against his head when listening to sounds from the sides or the rear, or—as in other mammals—to express anger. The other movement was forward; it could stand out, as in the elephant, at right angles to the head to catch sounds coming from the front. Judging from the position of the ears in new-born babies, one might suppose that the ears ordinarily stood out from the head like the two opposite handles of a round pot.

No doubt there have been instances of atavism in the human ear observed from time to time, just as in the case of the twitching-muscle. There are those who have this twitching power all over the head instead of in the forehead and muscles of the face only; so vigorous is it in some instances that the man is able to throw or shake off his hat by a sudden violent movement of the head-muscles, like that of a dog shaking himself. I also suppose that primitive man had the teeth-gnashing faculty, as I have known one man who had it as powerfully as it exists in the dog, in peccaries and pigs of all kinds, and other fierce mammals. This man was a Spanish Basque, a workman, and as he was musically inclined he had utilised his wonderfully strong teeth and teeth-gnashing faculty by turning his mouth into a musical instrument. Planting an elbow on the table and resting his chin on his hand, he would start the performance and go through a number of marches and martial airs far in advance, as music, of any performance on the bones I have ever listened to, and while the teeth were grinding, rattling and crashing together, the lips were rapidly moving to soften, deaden and louden the sounds. It was an astonishing kind of music, but not agreeable to me on account of an apprehension I felt that at any loud crash or finale the teeth would fly into pieces all over the room like two china vases brought violently into collision.

We know that the earliest man who has left traces of his life and mind in the holes he inhabited was an artist, that with rock and bone to work on he was able to express the sense of beauty and wonder in him, and to leave pictures of the wild life of his day—deer and mastodon and wild horse in flight—which move the admiration of the ameliorated man of over a hundred centuries later. Doubtless he had his music too, his composers, and "instruments of unremembered forms," and it is highly probable that, like my friend the Basque, he used his large powerful teeth and the teeth-gnashing faculty in his winter evening concerts, when the family sat round the fire in Wookey Hole or Kent Cave or King Arthur's Cave, and other rocky dens where they had their homes and hearths.

I have never come across anyone with a free or movable ear, but I once met a man who, when conversing with another person sitting by him or walking in the street, would always draw down the upper part of the ear on the other side of the head, and hitch the curve of the top lobe over the lobe at the bottom, thus closing the passage to sound from one side.

The question I am concerned with just now is: To what extent does the outer ear in its present condition, glued to the head and diminishing in size, help our hearing? Some physiologists have said that it helps us not at all, that but for the look of the thing we should be just as well off if our ears were all removed in infancy.

The light of nature, or experience, shows us that it is not so; that when we listen intently to sounds difficult to catch we almost instinctively put up a finger and push the ear a little forward; and it is possible the movement *is* instinctive and dates back to the far time when the ear began to lose its freedom of motion. Thus, in *Adventures of an Atom*, we read: "Soon as Gotto-mio stood up every spectator raised his thumb to his ear as if it were instinctively." A good observation worth rescuing from the dullest as well as the obscenest "classic" in the language. We have also the habit of holding an open hand behind the ear when listening; the hand thus held open, and the fingers curved forwards to make a hollow pan, is a substitute for the primitive ear when it was swung forward to listen to sounds from the front. It would not be difficult to ascertain by experiments just how far the outer ear does help us in the hearing. Thus the ear could be done away with by sinking it in and covering it smoothly over with wax, leaving the passage free. And it would perhaps be an agreeable experience to face the wind for the first time in this practically earless condition, to find that it had lost its sound, though still possessed of its full fury.

The noisiness of the wind when it blows in our face is a defect in us. Has it not been made so or aggravated owing to the ear having become fixed? Our ears, which we are incapable of moving at will, are like the iron guttering, the loose tiles and slates and weathercock on the roof of some high exposed house on a windy coast. The wind beats unceasingly on the exposed roof with a succession of blasts or waves which vary in length and violence, causing all the loose parts to vibrate into sound. And the sounds are hissing, whispering, whistling, muttering and murmuring, whining, wailing, howling, shrieking—all the inarticulate sounds uttered by man and beast in states of intense excitement, grief, terror, rage, and what not. And as they sink and swell and are prolonged or shattered into convulsive sobs and moans, and overlap and interwave, acute and shrill and piercing, and deep and low, all together forming a sort of harmony, it seems to express the whole ancient dreadful tragedy of man on earth—man and the noble intelligent brutes he warred and preyed on—a story told in a symphony by some unearthly Tchaikovsky or wandering spirit of the air, so fascinating that one can lie awake long hours listening to it, as I have on many nights in rough winter weather at the Land's End.

But there is no fascination in the noises made by the wind in our ears when it beats upon the loose cartilaginous slates and tiles and gutters attached to our heads and sets them vibrating. It is a pure annoyance, a flap-flapping as of flags; murmurings and rumblings mixed with sibilant sounds, also a good deal of thunder. It hinders hearing, and to get rid of it we are compelled to turn the head aside.

I take it that all animals with large ears are in some degree subject to this annoyance; it could not be otherwise, since their ears must vibrate in the wind like ours, and more than ours, and so create sound; but I also think that they are able to minimise the annoyance by slight voluntary, or perhaps automatic, movements of the ears to change the angle at which the wind strikes them.

But the wind is a long subject, and now I'm at it, I must go on about it in the next part.

III

Our senses—An atmospheric and wind sense—A difficult subject—Our feeling about the wind—Women's unsuitable clothing—Eastern and Western dress—A woman's fight with the wind—A ludicrous sight which was beautiful—An historical question—Light from the dark ages—Sheep-shearing—A saint's biography—Ellen in *News from Nowhere*—Wind in poetical literature.

UNDOUBTEDLY we possess several senses in addition to the five with which we are supposed to be endowed—the canonical five they may be called, or the seven with which some of the authorities now credit us, the two apocryphal or supplementary being the muscular sense and the sense of equilibrium. Others are not recognised as senses on account of having no *organs*; but into this question I do not wish to enter now, as at present we are concerned only with the wind, and I have no desire to shelter myself from it.

To begin with, I must say that we have an atmospheric sense, and that the wind is included in it as well as cloud, mist, rain, snow, sunshine, and so on; nevertheless, apart from all that, we may, or some of us may, recognise in ourselves something which may be called a *wind-sense*, seeing that it is, or so I believe, an effect on body and mind widely different in character from all other atmospheric effects. One has only one's own experiences to go by; this sense may be common or rare—as rare, say, as the sense of direction in civilised man; or, rarer still, the "sense of polarity." A difficult subject! The attempt to deal with it is like trying to grasp the wind in one's hand, and perhaps my best plan is to approach it in a roundabout way, with little tentative crawlings, springs and dashes, like a kitten trying to capture an elusive bit of thistledown on a windy polished floor.

A man I am acquainted with, the author of many books, once said to me: "All I know about the wind is that it is an infernal nuisance!"

Undoubtedly this is an extreme view for a man, but it is one almost universal in women. The natural man who works out of doors is not put out by the wind, although he knows when it is blowing, just as he knows when the sun is shining or is behind a cloud, and when it is raining. It is different with the man whose time is mostly spent indoors, whose skin is thinner and softer, his nerves of touch more sensitive. Yet even in such a one, despite the physical degeneracy caused by a sheltered sedentary existence, there is ever coming out a quick glad response to Nature's influence, a sense of something restorative, even in its rudest assaults. The man by himself or with other men feels this; but no sooner does a woman come on the scene than a change, a different attitude, is produced in him out of sheer sympathy. The wind distresses her, and he becomes infected with her feeling; and that feeling, after he has experienced it a dozen or a hundred times, becomes permanently associated with the wind and with the very thought of the wind. But if you explained to a man, who is your friend, the reason of the wind being an infernal nuisance to him, he would take it as an insult and perhaps never speak to you again. It would be a reflection on his manliness.

Woman's dislike of the wind, we know, is caused by her dress, or, let us say, because she has not yet found out the way to clothe herself suitably for outdoor work and exercise. Barbarians and savages know the way, but as our civilisation progressed and our women were more and more confined to the house, they clothed themselves for that condition mainly, and after several thousand years of study and experiment have succeeded in making their covering as beautiful as we want it to be. That is for so long as we think clothing necessary at all: the main fault with the clothing is that there is too much of it; but it is a fault which there is now happily a tendency to remedy. Undoubtedly there are Eastern costumes more beautiful; but to our Western eyes the beauty is of a kind which we do not desire to see adopted, since it is not in harmony with our Western feeling about womankind, and appears to us designed to give artificial or fictitious charm and allurement to the inane sex.

This indoor dress which pleases becomes unsuitable and even absurd when worn out of doors in wind and rough and wet weather, a usual condition in this "brumous island." The headgear, designed to harmonise with the costume, makes it worse; what wonder then that if a hundred women be asked their opinion of the wind, ninety-nine will reply at once: "I hate it!" The ludicrous spectacle of a woman in a high wind struggling with her skirts, her hat and her hair, endeavouring to keep her furbelows from flying away, and not to lose her sunshade and bag or reticule at the same time, is common enough. Ludicrous, I have called it, but it is also repulsive and painful, since it forces on us the painful fact of women's idiocy; we laugh or smile and are sad.

Once only in my lifetime have I seen such a thing and admired the spectacle of a woman's contest with her old hated enemy, the wind. It was on a brilliant spring morning, and I had just left St. Ives behind me to walk to Zennor on the Cornish coast. The blue sea on my left hand sparkled with whitest foam, whilst clouds were flying across the intensely blue sky, and the strong wind, which with the sunshine made the day so glorious, blew the fresh, sharp, salt smell of the sea, mingled with the spicy odours of the blossoming gorse, to my nostrils. I came to a point where the road is cut across at right angles by a narrow stony footpath running from a small farmhouse on my right, towards the sea, to another farmhouse on the inland side; and just when I arrived at this point I caught sight of a young lady coming from the first little house to the second; and as it was a strange figure in that rude incult wilderness of rock and furze, I stood still at the cross-roads and waited for her to come by, so as to get a full and satisfying look at her.

She was of medium height, but looked tall on account of her slimness—an elegant figure of a young lady of about seventeen or eighteen, all in blackest black, with a black feather boa and a wisp of black crape on a transparent or translucent hat of large dimensions which she was wearing—one of those wide yet almost invisible hats made of some unsubstantial material like thistledown or gossamer. With her left hand she anxiously held on to the rim or brim of the wonderful hat fluttering on her loose pale golden or honey-coloured hair. It was in an incessant flutter, trying to escape from her head and hand to fly over the hills and frolic with the wind. In her right hand, held out before her, she carried a tall slim vessel of some sort which sparkled like silver-white fire in the sunshine. And as she came down the rough rocky path towards me, stepping carefully, her eyes fixed on the goblet, she walked between two hedge-like rows of furze bushes covered with masses of shining yellow and orange-coloured blossoms. An unforgettable picture! As she came nearer I perceived that she was in great trouble owing to the wind, also that the sparkling object in her hand was a tall crystal goblet, brimful of Cornish cream, which she no doubt had purchased at the little farm near the cliff, and was conveying to the place she was lodging in. The rude, uncivilised wind was worrying her all it could, agitating her volatile hat, whirling the fine wavy loose ends of her boa about her head, and causing her skirts to wind themselves like black serpents about her pretty legs. And whenever they got tightly wound about them, she would stop and slowly and carefully turn round and round to get them free again, still keeping a hold on her hat, and her eyes fixed on the goblet for fear of spilling the Cornish cream. She was really a beautiful girl, so I had my reward; small delicate features and a complexion like the briar rose, and eyes of a blue that was like the sky above her.

Just as she crossed the road where I stood, the wind again struck her and compelled her to stand still and slowly make three turns round before proceeding once more. "A rather difficult task," I remarked sympathetically, with a glance at the goblet. "Yes, it *is* rather difficult," she returned, but the even tone in which she spoke was a *distant* one, and very dignified in so young a person. Nor did she lift her eyes; they were still fixed fast on the goblet of cream. Then slowly, slowly and carefully, she went on her way, leaving me congratulating myself on having witnessed a really beautiful thing—a better Delia in the country than any a Morland's coarse brush could paint. It was a subject that Whistler might have attempted: the colour scheme would have intoxicated him with delight; the slim, beautiful figure in its dead black coming down that piece of rocky path between walls of black-green furze, their darkness, which was nearly as dark as her costume, almost covered with the flame yellow of the flowers, and the blue sky with white flying clouds and the deeper blue sea, flecked with white foam, for a background. He once did something I was reminded of, a beautiful young lady in deep mourning, with black sunshade in her hand, sheltering herself from a sudden storm under a horse-chestnut tree in its golden yellow and red autumnal foliage. But there he had a black storm for a background and silver-grey raindrops over all the picture. This was an infinitely more difficult subject, an impossible one, owing to the intense light, the brilliant blue sky.

This incident has little or no bearing on the subject under discussion, and my only motive in introducing it is the common desire we all have of imparting to others anything wonderful or beautiful we have seen.

To go back: How long is it since this quarrel between woman and the wind has existed? As long, I suppose, as a costume only suitable for indoor life has been worn out of doors. A small ray of light on this subject comes to me by chance from mediæval times.

It happened, when my age was nineteen, that an old intimate friend of mine asked me to take charge of the sheep-shearing at a bankrupt estate on the pampas. He had undertaken to do it, but found he could not spare the time, and I was doing nothing just then. Accordingly, I went and established myself at the house of the mayordomo, or manager of the estancia, a barn-like building of unburnt bricks with a thatched roof, without a tree or bush or flower about it, surrounded with sheds and sheepfolds and cattle enclosures—a dusty, desolate place!

Here I established myself and kept the books, weighed the wool and paid the shearers every day, men and women, for we had them of both sexes; only a woman never got beyond her fifty per day, while some men would soar to a hundred, and even twenty more. And so we went on for about three weeks, until some thirty-five to forty thousand animals had been deprived of their fleeces. The siestas or lazy intervals in the day, and the evenings, were tedious in that hot, dusty, woolly place, and I asked my host one day if he had not such a thing as a book in his house. Oh yes, he joyfully and proudly replied, he had a book, one book, but a good one, a big one; and dashing off to another room he soon appeared with the one book—a huge old folio bound in thick leather, almost black with age. It was a life, in Spanish, of the Italian saint, John Gualberto, a great and holy man, as such things were accounted in the eleventh century, or as we might describe him from a twentieth-century point of view, a dull-witted, insanely superstitious, enraged bull in a religious china shop. A poem or romance would have suited me better, or at all events a book one could hold in one's hand when lying on a couch; but it was the one and only book in the house, and I had to read sitting at a table; and in this uncomfortable way, reading a few chapters at a sitting, I got through the whole of it—the dullest book I ever waded through, about the most detestable character one could stumble upon even in the histories of the saints.

After the blessed Gualberto's death, I read, there was a statue or monument of him erected in some public place, in the town of his birth, I think, but I forget about that; and no sooner had it been set up than miracles began to happen on the spot. Thus, if some starving beggar came along, and, plucking off his hat, fell on his knees to worship the saint, he would presently catch sight of a gleaming object in the dust at his knees, which would turn out to be a silver coin, which would serve to buy him food and wine. But there were also miracles of a contrary kind—miraculous punishments for those who had hard, unbelieving hearts and spoke scornfully of the saint and his works. Such a person would perhaps bark his shins against some obstruction he had failed to see, or would stumble and come down on his face on the stony road. And one day two women came by, and one, being of a frivolous and mocking disposition, made some derogatory remark about St. John Gualberto, and had no sooner spoken than a sudden violent gust of wind caught her and blew her gown over her head, which was the cause of much laughter and jeering from the onlookers, until she, overwhelmed with shame and confusion, fled from the spot.

Many of the ponderous biographies of the saints, writ by the monks of the Middle Ages, are like that, unpleasant to read, and if we desire to keep up any devotional sentiment about them, we must confine our reading of their lives to the modern bowdlerised versions.

But let us go back to the wind—let it blow from our brains the memory of saints and their miracles, nice or nasty. No doubt there are exceptions among women to this ancient hostility to the wind; one can even believe that the Ellen of *News from Nowhere* was not wholly evolved from the author's inner consciousness, when he tells us how she laid her brown hand and arm on the old lichened brick wall of Kelmscott Manor as if to embrace it, and cried: "O me! O me! how I love the earth, and the seasons and weather and all things that deal with it and grow out of it." I know one myself who delights above all things in long walks in a strong wind, who wears a cap and close-fitting costume—a form of dress as suitable, without being ugly, to all weathers as that of a man.

Such women are rare, and it is a sad thought that our system of life, our devotion to comfort, which adds and adds and goes on everlastingly adding to the attractions of an indoor existence, has the inevitable effect of making Nature increasingly strange and hostile to us.

I think in this connection of our poetical literature: how have our poets, for example, treated this subject of the wind? T. E. Brown thought the sea "the great challenger and promoter of song." This seems natural enough in an islander—and the Isle of Man is even smaller than England. Swinburne was never happier than when splashing about in the ocean, and he offers to exchange lots with the seamew, to give him his —Swinburne's—songs' wild honey in exchange for the seamew's sunny wide eyes that search the sea and wings that weary never. Then, he said, it would be well for him for ever. But, I venture to add, it would not be so well for the seamew.

The wind has not been so fortunate. One can't remember all the poetry one has read in a lifetime; one remembers only that the poet's wind is of two sorts, like two distinct entities. One is the warm and soft caressing wind that breathes among the flowers, stealing and giving odours, the spring wind ever associated with love's young dream; the other is the loud, the boisterous or blustering wind, "the wind Euroclydon, the storm-wind," the wind that howls like a hungry wolf about the house, or moans "in its strange penance," as one has it; the wind that is eerie and weird and uncanny, and is associated with the poet's darkest moods, the desolation of his soul, and distinctly encourages his suicidal impulses. It all seems like a convention which after many centuries has ceased to be one. I dare say there are many exceptions, but I can't recall them just now, excepting Shelley's wonderful ode.

And one other, and this only because it was written yesterday—the most soul-stirring hymn to the wind and the elemental forces of Nature I am acquainted with, the forces against which man has striven from the unremembered, the incalculable past even to the present day and these last four years of bloody strife. It is entitled *Barbarry Camp*, and was written in the year before the war by Captain C. H. Sorley, one of our young poets who have given their lives for England and France. I must quote more than a stanza or two. It is supposed to be spoken by the men, dead long ages—thousands of years ago, who burrowed night and day, and heaped the bank up and called it a ring:

And here we strove and here we felt each vein
Ice-bound, each limp foot frozen, all night long.
And here we held communion with the rain
That lashed us into manhood with its thong,
Cleansing through pain:
And the wind visited us and made us strong.

Up from around us, numbers without name,
Strong men and naked, vast, on either hand
Pressing us in, they came. And the wind came
And bitter rain, turning grey all the land.
That was our game,
To fight with men and storms, and it was grand.

For many days we fought them, and our sweat
Watered the grass, making it spring up green
Blooming for us. And if the wind was wet
Our blood wetted the wind, making it clean
With the hatred
And wrath and courage that our blood had been.

So fighting men and winds and tempests, hot
With joy and hate and battle lust, we fell. . . .

Wind that has blown here always ceaselessly,
Bringing, if any man can understand,
Might to the mighty, freedom to the free;
Wind that has caught us, cleansed us, made us grand,
Wind that is we,
We that are men—make men in all this land.

It is like the call of a trumpet to one who has long been a listener to the sweet and soulful, enervating sounds of citherns and citoles.

If anyone can understand? Does anyone really want to understand, especially just now when we are lapped in a dream of peace—perpetual peace and a federation of the world? It is a big place no doubt, and not all West, and we may cast an apprehensive look at Asia and Africa when causing the globe to revolve with a touch of the finger; we may well have a fleeting vision of a million million bi-coloured souls, gasping and straining towards a more open world, a wider space with room to breathe and live and propagate. Numbers without name, surrounding our Barbarry Camp, fencing us in! Let it pass—the ugly vision; let us fall to dreaming again as in those beautiful days before the last great devastating eruption of the Huns. Dreaming of peace on earth, everlasting peace, since to understand is to despair; does not the aspiration itself signify decay?

IV

On seeking for a way back to Nature—The natural man and his surroundings—When pain is pleasure—Man in unison with Nature—"Intuition of snow," a notion fantastic and true—Influence of the wind—The wind a promoter of thought—Flying thoughts—Help from the physicists—Phantasms in the wind—Telepathic messages—A domestic drama—Is the wind a mind-messenger?—A desire of the mind—The poet expresses it—Is it a delusion?—Conjectures—Mental embryology—Telepathy inherited from the animals.

I ONCE knew a man, an English sheep-farmer in South America, who would mount his horse on a rainy day in summer to go out for a long ride without a cloak, so as to get a thorough wetting. This was, he assured me, his greatest pleasure.

It reminds me of a great financier and millionaire who, when his day's business was done, would shut himself up in a room sacred from intrusion, where, throwing off his clothes, he would lie naked on a rug before a huge fire and soak himself in the heat for an hour or so. This, he said, was his best time, his chief happiness in life.

And a very good sort of happiness, as many of us know from experience; yet one pities that poor, unhappy, toiling plutocrat who had no other way of coming back to Nature.

I have known others whose chief happiness was in walking—walking steadily and fast their twenty or thirty miles a day, with no object at all except that it gave them a sense of escape from an irksome indoor existence; as so long as they were out, miles from home, they felt free and happy.

Another who from time to time would suddenly abandon his office, and going to the nearest terminus, take an express train and travel hundreds of miles, north or south, then off in another direction, and so for three or four days, borrowing his night-shirt and whatever he needed at the hotels he stayed at, after which he would return to London and business again. He explained to me that the irksomeness of his conventional indoor life, with so many hours each day in his office in the city, appeared to have a cumulative effect, and in the end would become unbearable; and he would then rush or run away, and travelling at express speed over long distances, he would get the illusion that he had made his escape from such an existence, and was flying for ever from it.

Others there are whose chief delight is in water—the sight and feel of it, running water, pools and lakes and the sea, to bathe in or to sit on the margin or by the shore, poring on it. Such a one was Shelley.

Still others there are who are exhilarated by thunder and lightning, who will go out in the most dreadful storms and stand gazing up delightedly at the tremendous spectacle.

All these peculiar preferences, and one could add many others, have one and the same origin—the sense of disharmony between the organism and its environment. By a happy chance the poor wretch has discovered a way of escape for a brief interval from his imprisonment—in violent exercise, in getting drunk, in exposing himself to the weather, in water, and even in lying naked basking like a cat in the heat of a big fire in the grate. A particular condition has become associated in his mind with the feeling of recovery, of relief, as if a burden had been dropped.

The natural man, living an outdoor natural life, although apparently indifferent, does yet experience a certain pleasure in all weathers and aspects of Nature. And I may say that this is how it is, and always has been, with me, and that there is a satisfaction to me not only in the aspects and weather and other natural conditions which please us or "flatter the senses," but also in those which produce discomfort and even actual physical pain or fear. To the town-bred person this may sound like nonsense, seeing that discomfort is not comfort, and fear is fear, and pain, pain—and pain isn't pleasure, is it? He must take my word for it that it is in some circumstances and in some persons, although he may not be one of them. The degree in which we are affected varies greatly, according to our bringing up and character and tastes and occupation.

But apart from all this, apart from the æsthetic feelings which the object or scene or atmospheric conditions may rouse, and from the sense of novelty, the lively interest we experience at times in what we see and smell and hear and feel, and from other causes operating in us, there is a sense of the *thing itself*—of the tree or wood, the rock, river, sea, mountain, the soil, clay or gravel, or sand or chalk, the cloud, the rain, and what not—something, let us say, penetrative, special, individual, as if the quality of the thing itself had entered into us, changing us, affecting body and mind.

It is possible that something of this feeling was in the mind, or at the back of it, of Willughby, the Elizabethan writer and "Father of British Ornithology," when he suggested that the white colour in birds and beasts in the Arctic regions was due to the constant intuition of snow, and the force of imagination. A notion which, after having seemed fantastic enough to cause many a man to smile during the last three centuries, will probably be seized upon and made much of by the biologists by-and-by. For who at this day can believe that the winter snow-white fur and feathers of hare, weasel, grouse and other arctic species, the sand-colouring of animals which is almost universal in sandy deserts, and the green plumage of many hundreds of species of birds in tropical forests, have been brought about by means of the Darwinian principle—the gradual accumulation and inheritance of a long series of small individual variations favourable to the individual itself and its descendants in the struggle for life? The insurmountable objection is and always will be that such variations are of the individual.

One drops into the language of metaphor in speaking of the evolutionary processes. The "better way" of one human protagonist may eventually triumph because he finds believers and helpers from the very birth of the thought, and they face the hostile world together. Nature also abounds in reformers, prophets, cranks, and improvers of their kind generally; but here the individual reformer can find no disciple; he is one against an incalculable multitude all wound up to keep on the old bad way so that his better way inevitably comes to an end with himself.

Imagination was not the right word, at all events in its restricted sense, while the other phrase of the constant intuition of snow suggests that these world-wide physical effects are due principally to a purely psychical cause. Well, I don't find it impossible to believe that. One always wants to find something to believe, some way out of the maze, for we do know that in the lower animals, as in man, the mind does react on the organism sometimes with tremendous power, to the production of strange results, as we see, for example, in cases of pre-natal suggestion.

However, just now we are concerned mainly with the atmospheric sense, and particularly with the influence of the wind.

While classing myself as an ordinary outdoor natural man, tolerant, and more than tolerant, of all weathers and Nature's influence in all her moods and manifestations, I yet fear when coming back to this subject that I shall find no support in anything said by others in what remains to be told. There is, then, nothing but my own personal experience, and as every face of man and every mind differs from every other face and every other mind, so it may be that the wind, when it visits me, tells me a story somewhat different from the thousands and millions of stories it has told and tells to others.

The effect of the wind on me, always greatest when it caught me on horseback, when, during the first half of my life, I was constantly riding and sometimes passed weeks at a stretch on a horse every day from morning till night, is now my subject. When in my teens I first began to think, I found that my best time was when on horseback, in a high wind. It was not like the purely agreeable sensation of a soft caressing wind, or of riding in a comparatively quiet air in a genial sunshine; it was a pleasure of a distinctly different kind, if it can be called pleasure. Certainly that word does not give the feeling its characteristic expression, but I have no other. It was a sense of a change, bodily and mental, a wonderful exhilaration and mental activity. "Now I can think!" I would exclaim mentally, when starting on a gallop over the great plain—that green floor of the world where I was born—in the face of a strong wind. Nor could it be said that this was only the effect of being mounted and of rapid motion. We know that merely to be on the back of a good horse does give us a sense of power and elation; or, as Lord Herbert of Cherbury says in his autobiography, "It lifts a man above himself." Here I may remark in passing that this feeling, as he describes it, is common to those who, however familiar with the horse they may be, are only on his back occasionally, or at all events not nearly so often as they are on their own legs and on chairs and couches. To one reared in a semi-wild riding country the feeling is somewhat different in the saddle one is there conscious of being simply in the right place, since owing to one's long and close intimacy with the horse, one manages him automatically without thinking anything about it, the mind being left quite free, just as a man in walking manages his legs. The effect was not then that which is produced by merely being on horseback and the swift motion, but almost exclusively of the wind.

Undoubtedly, one gets more air into one's lungs in a gallop than on foot, and the oxygenation of the blood is more rapid, but the greater exhilaration thus produced is experienced whether there is wind or not.

My experience in a high wind was as if, blowing through me, it had blown away some obstruction, some bar to a perfect freedom of mind; or as if the two minds in us, the conscious, slow, laborious mind, and the mind that works easily and swiftly in the dark, and only from time to time gives us a result, a glimpse, of its secret doings, had become merged in one, the thoughts coming and going so rapidly that it was like the flight of a bird, every wing-beat a thought, spontaneously clothed in an appropriate expression, coming and vanishing, to be instantly succeeded by others and still others. The poet says:

For what are thoughts
  But birds that fly?
And what are words
  But traps to catch them by?

Many are dead
  And lost in Lethe's river;
But some survive
  As joys encaged forever.

They would perhaps have been a joy for ever to me if I could have encaged them, but I couldn't; trap them I did, but they were too many, too elusive, so that I no sooner gripped them in my hands than they slipped through my fingers and were gone. I really think that if I could have devised some means of recording them, if I had had any idea of such a thing, they would have presented a strong contrast to the stodgy stuff I am obliged to put in my books since I started book-writing or book-making. The difference in the movement of my mind on these rides in the wind and now, sitting in a chair with paper and pens on a table in front of me, is, as I put it before, like the flight of a bird through the air—a sparrow-hawk, let us say, that flashes into sight over the trees on swift-beating wings and is instantly gone—and walking in heavy boots over a newly-ploughed field of stiff clay, saturated with last night's heavy rains.

Why and how did the wind affect me in this way? It is one of the innumerable puzzles, problems, mysteries, one is eternally stumbling against. Like everybody else, I am like an infant in the night crying for the light, and with no language but a cry. And answer there comes none. For what do we *know*—and what *do* we know—what do we *really* and *truly* know about what a friend of mine will insist on calling our "insides"? Meaning not our lights, livers and other organs, but that part of us where the mysteries are. For we do know a lot about our insides according to the physiologists and psychologists, yet they can't tell me why the wind had the effect of transforming me into a new and different being, one as unlike my ordinary self as, say, a sparrow-hawk is unlike a barn-door fowl. Will the physicist help me to understand it?

He, the physicist, tells us that we are only half matter—we are matter and ether; and ether isn't matter, but is the original space-pervading stuff out of which matter is evolved; and albeit not itself matter, since it is intangible, ungraspable, and has subtle qualities which do not pertain to matter, its elasticity and tenacity show its relationship to matter, and one of its functions here on this earth, to which it brings the light of sun and moon and stars, is to hold matter together, binding atom to atom, so that if its hold were relaxed this sensible being and the globe itself would instantly dissolve into thin air, leaving not a wrack behind. We are also told that when the atoms are violently agitated and pulled and thrown to this or that side, the corpuscles of which the ether is composed, or supposed to be, retain their hold on them and pull them back to their proper places.

This, too, we are told, is not hypothesis run mad, but sober matter of fact, and I am not going to say that I disbelieve it or even doubt. We are all, vitalists and anti-vitalists alike, always anxiously

> Watching and hearkening for ethereal news,

and when it comes, when more of it comes, as doubtless come it will, we shall know more than we do now, and by that time the physicists may be able to assist the other researchers in helping us to understand our insides.

The wind does not blow through me, although it assaults me violently: it bombards me with millions of atoms, and presses hard against me, not evenly, but in waves of varying strength, in blows, as it were, that can shake me even as they shake and make tremble the mighty trees and towers and bridges and great buildings of stones and wood and metal. My whole body, lifted above the ground on a horse, is vibrating violently, and although this body vibration does not translate itself into sound, it reaches the brain, even as sound vibrations do, and sets the mental machinery going.

There was more to say on this fascinating question, but as it must be all purely conjecture, I will leave it here to discuss another mystery which connects itself in my mind with the wind.

One autumn evening some years ago I was walking home in a London street, walking briskly in the face of a strong south-west wind, the one I love best of all winds in this hemisphere, thinking of nothing except that I was thirsty for my tea and that the wind was very delightful, when something extraordinary occurred, something never hitherto experienced. This was the appearance of a face—the face of a girl well known and very dear to me, who lived at that time at home with her people at a distance of eighty miles from where I was. It was the face only, the vivid image of the face, so vividly seen that it could not have appeared a more real human face if the girl had actually come before me. But, as I said, only the face, and it appeared to be in and a part of the wind, since it did not rest still for one instant, but had a flutter like the flutter we used to see in a cinematograph picture, and continually moved to and fro and vanished and reappeared almost every second, always keeping on a level with and about three feet removed from my eyes. The flutter and motion generally was like that of a flag or of some filmy substance agitated by the wind. Then it vanished and I saw it no more.

It was to me an amazing experience, as I am about the last person in the universe to suffer from delusions and illusions, being, as someone has said, "too disgustingly sane for anything," or at all events to experience such things; and I consequently soon came to the conclusion that this phantom was of a nature of a telepathic communication. Whether or not it was a right conclusion, the reader will judge when he knows the sequel. But I must first relate a second similar experience which came to me two years later.

I was out in a high wind, an exceptionally violent and very cold east wind in early March, on this occasion blowing on my back, and I was walking very fast over a heath towards a huge pile of rocks forming a headland on the west Cornish coast. I had visited the headland on the previous day, and had sat a long time on the summit of the rocky pile watching the sea birds, and on coming home I discovered to my disgust that I had left my nice thick leather gloves on the rock where I had pulled them off. And this high rock was unfortunately the favourite resort of a pair of ravens. My object now was to look for my gloves, with little hope that the ravens had not succeeded in tearing them to pieces in trying to devour them, or simply because of their innate cussedness.

This, then, was the sole subject occupying my mind, when suddenly once more I had the strange experience of a face fluttering before me—just a face as on the former occasion, just as real in appearance, at the same distance from my eyes, fluttering, moving as if blown to and fro, appearing and disappearing as before.

It was the face of a lady, an intimate and dear friend who was at a distance of something under four hundred miles from me at that moment.

As in the former case, I concluded that it was a telepathic message, and in that belief I rest. Why this phantasm appeared to me at that moment I am not at liberty to tell, but there is now unhappily no reason for the same reticence with regard to the first case; death has prematurely removed the dear souls who were the principal actors in that little drama, and its relation can hurt no one.

It was the case of a girl of fourteen I loved as much as if she had been my own daughter, because of her sweetness and charm and loving disposition, the bright clear temper of her mind and other engaging qualities; and I wished to adopt her—a desire or craving that sometimes attacks a childless man. She too desired it, but there were difficulties in the way which could not be overcome, and so the matter was dropped, or rather left for the time in abeyance. The appearance of that phantasmal face caused me to write at once to the mother to inquire after them all, particularly my favourite girl, and her reply was that they were all well and going on as usual, etc. Somehow this did not quite satisfy me; something in the child's mind had caused that vision, although the mother was perhaps ignorant of it. Before long I was able to pay them a visit, and found them, as I had been told, all well and going on as usual. The girl told me nothing, and I asked no questions. Nevertheless a suspicion lurked in my mind, and presently I became conscious of a slight change in the moral or mental atmosphere of the place, a change so slight that it could not be described as a restraint or a chill, but it was there all the same, a something which had come to dim the old bright family happiness and union.

Here it is necessary to tell what the atmosphere had been. They were an intensely religious family, church-goers, but not satisfied with the Sunday services at the village church, they made it a custom to attend religious meetings and week-day services in their own and the neighbouring village. Which was only the right thing for them to do, considering their evangelical doctrine with its Methodist colouring, which was that their God was a jealous God Who watched their minds, taking note of every thought in them, and Who desired them to live with one object before them—to save their souls from everlasting perdition by availing themselves of all the means of grace at their command. They were all of that mind, all having undergone or suffered conversion, excepting the girl I was fond of; and naturally—seeing that all her merits, her beautiful disposition and crystal purity and goodness of heart, her love of them all and of all living things, were nothing but "filthy rags" in their God's sight—until she was regenerated and the original sin, derived by inheritance from our first parents, was washed away in the blood of the Redeemer, they could not regard her as "saved." Sudden death at any moment might precipitate her into the burning pit out of which the smoke of the torment would ascend everlastingly. A sad fate for that beautiful, innocent soul!

There are still people in England who hold this form of Christianity. I know it, because I have associated and discussed these subjects with them. And when I live with people, although only a lodger, I like to be one with them. When staying with this family I loved them, for they were all lovable, and I elected to be religious too, as far as outward observances went, and attended meetings, and insisted on getting up at half-past six on winter mornings to attend family prayers before breakfast at seven by candle-light. At the same time it was a pleasure to know from her own lips that my loved girl was not going to be converted, because, as she explained to me, there was nothing the matter with her. She went to church and said her prayers, and thought that was enough. But I did not know, for this she kept from me, that the pressure which had been brought to bear on her had become increasingly painful until the breaking-point was reached.

About that I now heard. On the second day of my visit the mother, finding me alone, said there was something she thought it right to tell me. I had written to her a little while back, inquiring, as she thought, a little anxiously about their welfare, especially about my young friend, and she had answered that they were all well. So they were, but a day or two before receiving my letter there had been an exceedingly painful scene with the girl. She had suddenly, to their amazement, broken out in a passionate revolt against them on account of the religious question which had been troubling their minds. She told them that she had prayed to Heaven to send me to her assistance—to protect and deliver her from them. She had also, she said, made up her mind to leave them, and if she had no money to pay the railway fare, she would walk and live on charity by the way until she came to where I was or found me. It was, the mother said, a trying situation, and gave them all the greatest pain; they began to think they had worried her too much about her religious indifference. They told her how sorry they were, and succeeded in pacifying her by promising not to trouble her any more, but to leave her to follow her own mind about such matters.

They must indeed have gone through a painful experience, I thought, seeing the state of mind it had caused in the mother, which made her open her heart to me about it, knowing, too, beforehand on which side my sympathies would lie.

Believers in telepathy will say that I was justified in my belief that there could be no explanation of my strange experience other than the one given; while the unbeliever will say, as usual, that it was nothing but coincidence.

My experience—the two appearances of phantasmal faces—has been described here solely because it somehow appears to fit in with my whole idea about the wind—its powerful effect on the mind, or shall we say on the matter or substance of the mind; and I do not find it impossible to believe that one of its effects is to make the mind more sensitive to telepathic communications. In both instances the wind, a strong south-west wind and an east wind blowing a gale, blew from the direction of the persons whose minds were occupied with me at that time.

Perhaps I should have seen the faces if the wind had been blowing in other directions. I doubt it. As I have said, they appeared to be in the wind, and of it, or as if the wind had blown them like gossamer or thistledown to me. Doubtless, they were images on the brain, projected into the air, as it seemed, and their incessant windy motions perhaps corresponded with an agitation in the brain, or with that substance of it in which the affections, memory, reason and imagination reside, with perhaps other faculties we know not of or are only just beginning to know. And if, as I imagine, the wind was the cause of the agitation of the brain—the wind or the subtle immaterial substance which pervades the brain and the wind alike, or perhaps moves with the wind—then the direction in which it blows may be a fact to be taken into account as wafting or blurring or making a vivid mental message from a distance.

There was, and is, much more to say on this subject —this new and strange problem in psychology, which is after all perhaps one of the oldest in human thought. Only just now, when it comes to us under a new name and increasing knowledge of its manifestation, it has acquired a peculiar interest, in some instances a personal one, but in all of us it sharply pricks curiosity. And the prick is all the sharper in my case since I seem at times to catch a glimpse of a connection between this and still other mysteries. At present want of time and space compels me to abandon it, to be picked up when the opportunity offers at another time, although (to take a hint from Sir Thomas Browne) that time may be when I am no longer here. I am finding it prudent on this voyage to relieve myself of a good deal of material —many bales and crates of merchandise collected in many outlandish places; otherwise this slow ancient barque, with only the wind to keep her going, will never reach port. Nevertheless, before dropping it I should like to put down a few thoughts and suggestions to bring this chapter to a conclusion.

It will be remembered that the only instances I have given of telepathy relate to but one aspect of the phenomenon of thought-transference, and this the most arresting, the most startling in its manifestations, being that of apparitions or phantasms of the living, the message or shock invariably proceeding from a person in a moment of supreme agitation and, frequently, in the agonies of death: the percipient as a rule being one closely connected with the sufferer by ties of relationship and affection. Furthermore, it is known or assumed that the sufferer is passionately thinking of the absent and loved one at the moment, and that the thought finds its objective over long distance, and appears as a wraith or phantasm.

Now we know that this faculty, this power of the mind of projecting itself in such moments of violent disturbances, is a useless one, seeing there can be no response, no helpful action, nor even a return message, and that its only effect is anxious doubt or keen distress in the percipient. Is it not then curious to think that this useless sense, or faculty, which is in some if not all of us, and of which we are unconscious, is the very one which all men desire to possess, only with this difference, that they want to be conscious of it and able to control and direct it? There is a time in the life of a natural man when his most ardent, most burning wish is for some undiscovered way, some unknown faculty by means of which he can communicate with the absent or lost loved one. Often enough this passion that feeds on the heart, that makes life a torment and darkens the reason, actually brings the sufferer to the belief, or the brink of it, that it is not impossible that in a dream, or by an effort of the will, or in some other unknown way, the miracle can be brought to pass. And with this feeling there is sometimes the thought that if it cannot be so long as both are alive, death will yet make it possible to the craving soul.

The author of *The Bothie of Tober-na-Vuolich*, who never heard of telepathy, since the word was not invented in his day, has, to my mind, given this universal feeling, this burning desire to be with and comfort the absent one, its most perfect expression in the following lines:

Is it impossible, say you, these passionate, fervent impressions,
These projections of spirit to spirit, these inward embraces,
Should in strange ways, in her dreams, should visit her, strengthen her, shield her?
Is it possible, rather, that these great floods of feeling
Setting in daily from me to her should, impotent wholly,
Bring neither sound nor motion to that sweet shore they heave to?
Efflux here, and there no stir nor pulse of influx! . . .
"Would I were dead," I keep saying, "that so I could go and uphold her!"
Surely, surely, when sleepless I lie in the mountain lamenting,
Surely, surely, she hears in her dreams a voice, "I am with thee,"
Saying, "although not with thee, behold, for we mated in spirit,
There when we stood in the chamber and knew not the words we were saying."
Yea, if she felt me within her, when not with a finger I touched her,
Surely, she knows it, and feels it while sorrowing here in the moorland.
"Would I were dead," I keep saying, "that so I could go and uplift her."

There we have it all! Is it for nothing this intense, this intolerable craving of the soul for the absent one, this cry of the heart and throwing out of the arms, as it were, has been given him—this plangent emotion which seems to lift and bear him out to that sweet shore it heaves to? "Surely, surely!" he cries, hoping against hope, "it cannot be impossible!" And if impossible, then let death come, since then all barriers will be overpassed and he would be there to whisper, "I am with thee," to uphold her and uplift her!

It has been said by certain writers of books which the reader is invited to regard as prophetic that there is nothing he desires which is unattainable by man, if only he desires it ardently and persistently enough—if he hopes and believes that the desire itself will eventually bring about its fulfilment. But of this desire of the mind to be able to project itself, consciously, at will, to a distant one, we can only say that it exists in millions of men, that it has so existed for untold generations, and is still nothing but a vain dream and desire. The delusion of a mind abnormally excited; and as that form of excitement goes as far back as the existence of man on the earth, we may say that the wish and the delusion it gives rise to begins when and where thought begins.

We ourselves sometimes cherish the delusion, probably imparted to us by anthropological and other masters, that the passion of love, in all its forms of devotion to a loved one, is different both in character and degree in savage and primitive people from the feeling in us. Doubtless it is true in some cases, in some degraded tribes or races, but it is not a general truth. Savage men are capable of every form of love and self-sacrifice as well as ourselves (there are many exceptions among ourselves), and not only so, but the love of another goes further back to the lower animals, which are often known to pine and perish of grief and misery at the loss of a mate or companion.

I dare say that many a reader will be ready to challenge every word I am writing on this obscure subject. I can challenge much of it myself. For example, when I say that this particular wish, with the delusion it gives rise to, is as old as thought, human and semi-human, and is still nothing but a wish and delusion, how do I know what has been in the past—that dreadful past of man's history on earth? Absolutely nothing, or no more than we can know from the study of a few fossil thigh-bones and an occasional skull. And all that these tell us is that distant races, our own and other species of men, have been in the occupation of continental areas for long periods of time, probably untold thousands of generations, and that some of these races were larger-brained than the men of the present era. Of their nature, their inner life, we know and can know nothing, and can only suppose that they had developed a mentality wholly unlike ours. They did not build cities of stone to live in, or, in other words, they did not create new artificial conditions of life, to be themselves remade by the conditions they had created, and were therefore not civilised in our sense. Theirs was then the simple life, the life of animal and savage, with, perhaps, the savage nature outlived. We are told, at all events, of one of these large-brained races, that their dentition was different from ours, that they had no canine teeth, and were not flesh but grain-eaters. What, then, was the culture of these human beings of thirty or forty—some say fifty—thousand years ago—these men that did not feed on flesh, animal or human, and probably had no weapons of offence and made no wars? I don't know, and it was therefore nothing but presumption on my part to say that this universal desire of the soul in man to have the power to project, or to impart, itself to another one has never been anything but a wish and a delusion.

"But whither will conjecture stray?" as Wordsworth asks. In this case only this far. We cannot imagine a mentality other than our own—that of a wasp, let us say, or of a visitor from Mars; or even of a member of the human race of a subspecies nearly allied to ours, whose mental evolution has progressed so far and lasted so long as to have given him a far bigger brain than we possess, since the evolution has not been on our lines and is consequently to us unimaginable.

Nevertheless we are not wholly without hope, so let us go cheerfully stumbling and fumbling on; or "rushing in," as the anthropologist, physiologist, biologist and psychologist will each exclaim with a giggle from his own particular water-and-air-tight compartment.

And what gives us hope is something still to be found in ourselves—in some, if not in all, of us; vestiges of ancient outlived impulses, senses, instincts, faculties, which stir in us and come to nothing, and in some exceptional cases are rekindled and operate so that a man we know may seem to us, in this particular, like a being of another species. They are numerous enough, and when collected and classified they may form a new subject or science with a specially invented new name, signifying an embryology of the mind.

We know now that telepathy or thought-transference in the extreme and violent form in which it has been so far discussed here is not an exclusively human faculty, but is common to man and the lower animals—to some of the higher vertebrates, so far as we know at present. Up till now the authentic cases on record which concern the animal relate to telepathy between the man and the animal, but I now have a perfectly authentic case of telepathy of this kind between animal and animal. In this one case I have before me I see that there is this difference between the animal and man, in that the brain-wave or vibration in the former does not appear to the percipient as a phantasm, but translates itself into sound, to an agonising cry for help which meets with an instant response.

From this solitary instance we may form a guess as to what telepathy may be, its function and importance, in wild animal life; and if we, even in the artificial conditions we exist in (and have existed in for thousands of years), the inevitable effect of which is to wither and kill the faculties suitable to a purely natural life—if we still have remains or vestiges or intimations of these lost faculties in us, is it not probable that the large-brained men of the far past who lived with nature had them too, in a larger measure and perhaps another way; that they developed and flourished in forms and a lustre unimaginable to us, apart from nature, in our warm clothing, in the close shelter of our houses?

How was it possible, one may ask, that a race of men, physically strong, no doubt, as the animals are, cultivators of the soil, since they must have sown and harvested the grain they fed on, could exist for long ages on the continent of Europe in a region abounding in powerful beasts of rapine and surrounded and pressed upon by more savage men, armed with spears and arrows and axes, hunters, fighters, cannibals—how is it possible they could have maintained existence in such conditions unless by a mental development—mental and physical, let us say—which gave them power over their enemies, man and beast? And that power could but have been the result of faculties, long trained and highly developed, which with us are rare and startling phenomena, and are described as occult or supernormal or even supernatural.

Here then for the present I drop the subject, since it cannot be fully treated in this book—this story without an end, in which so many matters can only be touched on. Telepathy here, as stated before, is but one aspect or form or manifestation of what is called thought-transference; not quite rightly so called in this form, seeing that thought, or any mental faculty beyond memory, can have little to do with it. It is rather of the nature of a sudden or spasmodic and unconscious discharge of a violent and painful emotion. How discharged, or how it came to be bottled up so as to make it dischargeable in that special way, is the mystery. Unconscious, spasmodic, violent, yet resulting in something in appearance thought out, definite, sane, intelligible—a message from a subject in pain or trouble or agony which hits its distant mark and is visualised as an apparition or phantasm by the human percipient, and is heard as an acute cry of distress, a summons for help, by the animal. What can we say of it except that it is inexplicable; or that it is a striking example of that vaguely conscious something, force or principle, in nature, which we sometimes roughly name "unconscious intelligence," a diffused mind in or behind nature which gives a sort of supernatural disguise to phenomena?

But that indefinable something in or behind nature, that formative principle, ever blindly feeling and struggling on towards a definite goal, which the mechanicians interpret in one way and the Doctor Henry Mores of the past and the Flammarions of the present in another, is in everything—in all organisms, animal and vegetable, in every cell. And as to telepathy, the plain common-sense view of the matter is that the Flammarions had better drop it as an additional proof of the existence of a soul, or else overcome all opposition to the idea of sharing their heaven with the lower animals.

V

Wind and the sense of smell—Scent in deer and dog—Sense of smell in man—In the Queensland savage—Sense of smell in different races—Purely personal experience—The Smell of England: a mystery and its solution—Aromatic and fragrant smells—Wordsworth's vision of Paradise—Sweet gale—Bracken—Gorse and its powerful effect—Spiritual quality in odours—Cowslip—Melancholy flowers—Honeysuckle and sweet-briar—Shakespeare and Chaucer on its scent—Chaucer, though old, still living—Scents and their degrading associations—Frankincense.

THE wind was the subject of the last chapter, then that of telepathy cropped up and occupied the last half. But the gust had not blown its fill: there was indeed very much more to say about it, only here I seem to be standing alone in it, feeling it, thinking of it, and it will probably be best for me to wait for others — physicists, physiologists and psychologists—to come out and feel and listen to it with me.

There is, however, just one matter, a simple fact familiar, I dare say, to most persons, which I either forgot to mention, or did not emphasise when writing in praise of the wind. It will now, I fancy, come best in this place, since it will serve to link the last chapter with the present one, which has for its subject the sense of smell.

When a smell—a flowery fragrance, let us say, to be on the agreeable side of things—is blown to our nostrils, the nerve's sensibility is not quickly exhausted, as it usually is in a quiet atmosphere. The sense ordinarily becomes tired so soon that we are annoyed with our olfactories for serving us so badly. In a wind the scent comes in gusts, and however fragrant it may be, there is little or no diminution in the effect produced.

I suppose the explanation would be that the nerves of smell and the liquid covering them are agitated by the wind, and that in this condition the scent particles are more rapidly and thoroughly dissolved, and so have a greater stimulating power than at other times.

When watching the hind in Richmond Park I thought with admiration of the exquisite perfection of the three most important senses in a wild animal's life—vision, hearing and smell. The dog, with a horizon limited to about a third of a stag's, is a comparatively dim-eyed creature; he lives, as we see, mainly in the sense of smell. This is astonishingly acute, but that of the deer is just as perfect with regard to its use or purpose, which is chiefly to inform it of distant or hidden dangers to be escaped only by flight. The dog's smell is concerned with numberless little matters that are of less account; these constitute his entertainment and give a perpetual zest to his life. He quarters and examines the ground with his nose to find it abundantly sprinkled over, so to speak, with the visiting cards of other creatures—other dogs, some known personally to him, others strangers; also rabbits, rats, voles, and what not. The deer is not concerned in these minute matters;

if a rabbit or mouse has crossed his track he is not excited about it, and bits of carrion hidden in the grass, and small local stenches, in which the dog revels, are nothing to him.

No doubt there is a vast difference in power in the sense of smell in both these animals and in man; nevertheless, I don't think so meanly of man's olfactories as some physiologists appear to do. It is a common idea, and is in the books, that man's sense of smell is decayed; some writers have gone so far as to describe it as obsolescent.

Who, we may ask, is *Man* in this connection? It would be nearer the truth to say that the more civilised man becomes, or the more he secures himself against the forces of nature by improving his conditions, the less important to his welfare does this sense become. The dangers he is warned against by smell in a state of nature have been removed artificially; in an environment in which the function of the olfactories has been superseded, the inevitable result is their decay. This is in accordance with Nature's economical principle; she will not continue doing for us what we have undertaken to do for ourselves, and will cheerfully scrap the exquisite apparatus she has been building up for our safety in thousands and millions of years.

When I see a lover of flowers and their perfumes pressing a bunch of violets to her nose as if to drag something out of them with her nose, to stimulate by violence, as it were, by repeated sniffing inhalations, a torpid sense—the sense which she knows is in her although it may have given no evidence of its existence for some time past—when I see this, knowing at the same time that the violets' "nimble emanations" are filling the whole room, I recognise the fact that the sense of smell is so enfeebled in her as to be of no account at all; also that it may be the same in a majority of the inhabitants of London and of all the great urban centres of human life in England. All that doesn't come to much, seeing that England is but a dot on the map and its people a mere roomful compared with the population of the globe. What one asks to know is, does the Armenian, the Turk, the Siberian, the Zulu, the Arab, the inhabitant of the Roof of the World, press a flower to his nose in order to get the sensation of its fragrance?

When the traveller and naturalist Lumholtz lived with the cannibal and ophiophagous tribes of Queensland, he found that they hunted the serpent, a large species of boa on which they fed, by its scent. This serpent travels long distances in quest of prey, and once on its scent the natives would follow it like a pack of beagles, through woods and thicket, marshes, over rocky tracts and all kinds of country, until they came up with it. The scent, they assured him, was quite strong and easy to follow, but though he went down on all-fours and sniffed with all his might, he could detect no scent at all. There is, then, a considerable difference between man and man with regard to this sense in different countries and conditions. The man of the physiologist is the one he knows, who is of his own state in life, who lives in comfortable circumstances in an equable temperature. Again, Humboldt relates that the Peruvian Indians distinguished between the footprints of their own people and those of whites and negroes.

There are, besides, the aborigines of America from Alaska to Tierra del Fuego, the Africans, the Polynesians, the Malays, the inhabitants of a thousand oceanic islands, the Asiatics. I suppose that at least a hundred thousand Europeans have written books about China, Hindustan, and all the other countries of that vast continent, but I doubt if there is a chapter in the hundred thousand books dealing with the sense of smell in any Asiatic people compared with ours.

Having, then, few or no facts to go upon, we are very much in the dark about this sense; we can only suppose that, if it be accepted as a principle that its decay proceeds *pari passu* with the increase in the value of vision and the improvements in our artificial condition of life, the decline has been greater in the town-dwelling and comfortably-off classes in England during the last two centuries than in the previous two thousand years.

To dogmatise on such a subject would be ridiculous; we are even more in the dark than I have made it appear. By watching a man and subtly drawing him out, we can penetrate through his mask and discover his secret and real mind, but we can't get at the real state of his sense of smell. Each one of us knows his own, and many of us only know it "in a way." Wherefore I'm glad to get away from this wide and general view of the subject, and to confine myself for the rest of this section to the purely personal aspect of the matter—my own private sense of smell.

So long as a smell is not a warning or disgustful one, even if acrid or sour or pungent, it is agreeable to me. The heavy greasy smell of sheep, for instance, and of sheep-folds, of cattle and cow-houses and stables, of warehouses filled with goods, and drapers', grocers', cheesemongers', and apothecaries' shops, of leather and iron and wood, of sawpits and carpenters' workshops. Wood-smells are indeed almost as grateful as aromatic and fragrant scents. And many other smells—tanneries, breweries, and all kinds of works, including gasworks. But it is always a pleasing change from the great manufacturing centres to the country and the dusty smell of rain after dry, hot weather; the smell of rain-wet pine-woods, of burning weeds and peat, and above all the smell of the fresh-turned earth—the smell which, as the agricultural labourer believes, gives him his long, healthy, peaceful life.

One of my first sharp unforgettable experiences in England was a novel smell, which I will not say assailed, but rushed hospitably on me to receive me, so to speak, in its soft, flesh-like, welcoming arms—an earth-born, thick, warm smell, something like cookery and Russian leather, a happy, pleasant smell the like of which I had never encountered before.

I had just landed at Southampton on a bright morning in early May, and the whole air seemed redolent of it, just as it seemed peopled with the chirruping sounds of innumerable sparrows. What was it? I consulted my fellow-passengers on the question as we strolled about the town, glad at being on firm land after thirty-one days at sea; but though there were Englishmen in our party, no one could give me any information. They assured me that they did not perceive it, and didn't believe there was any such smell. I set them down as poor noseless creatures with wisdom at one entrance quite shut out. These voyaging companions soon drifted away, leaving only one of their company, an American, who said he had nothing to do except to see England, and so would stay with me until I had exhausted Southampton. We took long walks about the suburbs and over the neighbouring beautiful common, he always sticking to me, and still the strange agreeable smell attended me. Then we hired a trap and youth to drive, and went farther afield; we were constantly shouting to our driver to tell us what *that* was. There were sights and sounds and smells in plenty all new to me. I was intoxicated with delight at listening to the skylark mounting up in the blue and pouring down his ecstatic music. My companion, whose mind was practical, cared for none of these things, but was curious about the state and system of agriculture. "What do you call *that*?" he shouted, pointing to a field of red clover in flower as we flew past it. "Grass," said our Briton. "Yes, yes, but what kind of grass?" "Grass—what the horses eat," he returned. "I only wish the horses had eaten your head off," said my companion, and the poor driver looked puzzled and hurt.

Even at a distance from the town I received whiffs of my mysterious scent, but it diminished the further I went. Returning to the town it would again seem universal and powerful, yet I could not find a native of the place to tell me what it was. They did not perceive it, they all told me, and I came to the conclusion that as they lived in it they had ceased to smell it—that it was the smell of the place, of the country, and I called it the Smell of England.

Afterwards in London, then in Gloucestershire, and later in Scotland, I almost lost sight or scent of the Smell of England. Occasional whiffs came to my nostrils, but I imagined I had, like the natives, lived long enough in it to become unconscious of it. Then after many months came the day when the mystery was revealed. I was in London, walking thoughtfully up Oxford Street, when on approaching Tottenham Court Road a powerful gust of the now old familiar smell came on me and brought back a vivid memory of my first day in Southampton, when the Smell of England was new to me. As I advanced the gusts became frequent and increased in power, until I was at the side of a big building from which issued clouds of steam and hot air from a dozen conduits, and dull rumbling noises of machinery. The whole air had become a bath of the thick, sweetish, warm, half-flowery and half-savoury smell. And the building was a brewery, and the smell was the smell of brewing!

Of natural odours, the most agreeable are the aromatic and fragrant that emanate from plants. The odours of spices and fruits, all more or less associated in the mind with tastes, are of a distinctly lower or less intellectual or æsthetic order. It is related of Wordsworth that he was without the sense of smell, and that on one occasion when he was sitting on a spring day in his flowery garden the unknown sense suddenly came to him to astonish and delight with the lovely novel sensation. He described it as being like a vision of Paradise. A similar vision has been mine at frequent intervals all my life; I doubt if its loveliness has been less in my case than in that of the poet, to whom it came once as by a miracle. When a gust of flowery fragrance comes to me, as when I walk by a blossoming beanfield or a field of lucerne, it is always like a new and wonderful experience, a delightful surprise. The reason of this effect, I take it, is that odours do not register impressions in our brains which may be reproduced at will, as it is with sights and sounds. Thus odours never wholly lose the effect of novelty. We remember that certain flowers delighted us with their fragrance, but cannot recall or recover the sensation; there is no record, no image. Nevertheless, the bare remembrance of it—of what it was to us at the moment—is a joy for ever. I think of certain flowering trees—catalpa, orange, lime, mimosa, acacia, locust, with many others—and cherish a love of them which is almost like the love that some woman has inspired in us with her charm, the quality which has lifted her above other women and endowed her with a beauty above all beauty.

Trees differ from trees in glory in this respect. I think less of orange and lime than of the Pride of China or Tree of Paradise, as it is variously called; I often stand, in memory, in the shade of its light loose feathery foliage, drinking in the divine fragrance of its dim purple flowers, until I grow sick with longing, and being so far removed from it feel that I am indeed an exile and stranger in a strange land.

It has always been a subject of wonder to me that so many persons find the loveliest perfumes excessive or oppressive, as when they stand by a flowering syringa bush, or are in a room with fragrant flowers —lilies, stock, mignonette, and various others. I can never get too much of it nor quite enough to satisfy my smelling hunger. Thus I love to spend entire days roaming about on boggy or marshy heaths, perhaps less for what I see and hear of wild life than for the sake of the odour of golden withy or sweet gale, where there are acres of it, and I can stand knee-deep among its thick-growing shrubs and rub my hands and face with the crushed leaves and fill my pockets with them so as to wrap myself up in the delicious aroma.

Almost all aromatic plants are agreeable to me—fennel, horehound, tansy, pennyroyal, and all mints, even the water-mint, which most persons find too powerful. Also bracken when it first unrolls its broad fronds, and I crush it to get the unique smell, which suggests castor-oil and the fish-and-cucumber odour of smelts—a strange and fascinating combination.

The fragrance of gorse is not of the highest order, yet it holds and enchants me above most flowers, and being itself a sun's child, like the sunflower, or sun-gazer as we call it in Spanish, its habit is the exact opposite of that of the "melancholy flowers," which shed their soulful fragrance like tears in the darkness and silence of night. The gorse is most fragrant at noon, when the sun shines brightest and hottest. At such an hour when I approach a thicket of furze, the wind blowing from it, I am always tempted to cast myself down on the grass to lie for an hour drinking the odour in. The effect is to make me languid; to wish to lie till I sleep and live again in dreams in another world, in a vast open-air cathedral where a great festival and ceremony is perpetually in progress, and acolytes, in scores and hundreds, with beautiful bright faces, in flame-yellow and orange surplices, are ever and ever coming towards me swinging their censers until I am ready to swoon in that heavenly incense.

Yet, as I have said, this fragrance is not of the higher order, since in its richness there lurks a suggestion of flavours. Its powerful effect is probably partly due to association with the sight-impressions the blossoming plant has imparted to the mind of its splendour. Many of our other wild flowers come nearer to the spiritual quality in fragrance, like the blossoms of the Pride of China; also the evening primrose in some of the most fragrant species where it is found growing in profusion in its native land. We have it in the hedge-rose, violet, bog asphodel, primrose, scented orchis, for example. And I would even include, or I should like to include, the cowslip; but it is too delicious.

If by chance I have a reader who shares my feeling concerning the scent of flowers and would like to experience the full deliciousness of the cowslip, I would advise him to repair at its season to that curious strip of flat country extending from the lower reaches of the Somerset Axe to the River Parret below Bridgwater. It is all meadow or grassland drained by innumerable dykes, which divide it into vast fields of an emerald green; it is on a level with the sea, or a little below the level at high tide, protected from it by the old bank made by the Romans in their day. Here you may come upon a field of close-cropped grass abundantly sprinkled over with cowslips and no flower of any other kind. The stems, crowned with their little nodding clusters, grow but a foot or two apart and four or five inches high, so that lying flat on your back you have them pretty well on a level with your nose. Imagine the sensation on a day of brilliant sunshine with a warm light wind blowing wave on wave of the delicious fragrance over you!

Before finishing with this part of my subject, I must say a word about a curious phenomenon respecting the flowers which Linnæus called "melancholy"—those which pour out their sweetness most copiously by night. One of the commonest is the honeysuckle;

and sometimes when I am out at night walking in a deep lane with untrimmed hedges on either side, I all at once come into an air so laden with the rich perfume as to cause it to seem thick or dense, then after two or three steps further have passed again into a perfectly scentless air. If I then turn back to get once more into the fragrant area I cannot find it. Frequently I have walked up and down a dark narrow lane for half an hour in search of the lost scent, and have also hunted for the plant in the hedge from which it emanated, and have failed to find either scent or plant.

This was a puzzle to me on many a summer night in the south and west of England, where honeysuckle and other fragrant plants are most luxuriant, and I can only suppose that in the still, warm night air the massed flowers pour out their fragrant particles into the deep lane below, and that the fragrance does not disperse, but remains suspended in the air as if enclosed in a film until the wind created by some heavy moving body—a stray donkey, or belated labourer plodding home, or a night-prowling field naturalist—sends the whole mass floating like a cloud or bubble away.

The most delightful experience of this kind is when the cloud of fragrance encountered is from no flower, but from the leaf of the sweet-briar. In some districts in southern England it flourishes so greatly in the hedges that one can count on finding there clouds of fragrance in the lanes on any still, warm summer night. It is a fragrance pleasing to every one, yet one would have to go far back in our literature to find its characteristic expression—even to a time when possibly the sense of smell was more acute in our race and flower-fragrance more delightful than they are to us. Shakespeare has it:

> The leaf of eglantine which not to slander
> Outsweetens not your breath.

How beautifully expressed! Not to slander the scented leaf! Yet we know that it is a sweeter, richer fragrance than the love-odour of a woman's breath; this is like the heifer's breath, which smells of milk and new-mown hay, combined with a fragrance most like the delicate scent of red clover, but it is made sweeter than all essential oils from leaf and flower by love and passion.

However, I prefer my favourite Chaucer:

> And I, that all this pleasant sightë see,
> Thought sodainlie, I felt so sweet an aire
> Come of the eglantere, that cirtainlie
> There is no hert, I deem, in such dispaire,
> Ne with no thoughtës froward and contraire
> So overlaid, but it should soon have bote
> If it but once did smell that savour sote.

Or to put it in plain prose: "Is there a man on earth in such despair, so overloaded with cares and maddened with anxious thoughts, who would not find instant relief and forgetfulness of all his miseries on inhaling this delicious fragrance of the sweet-briar?

And I would ask: Is it conceivable that any poet of this time (and I believe that the number of those now living in this country exceeds a hundred) could have such a thought, or having it, would dare to put it into words? If he did, what a ridiculous, extravagant person he would seem, to be sure! But, as I have already hinted, it is possible that Chaucer, albeit so great intellectually, was nearer to primitive man physically than we are in the acuteness of his senses and child-like delight in sights and sounds and smells.

I am tempted to go a little further with this subject, as in taxing my memory for some adequate expression concerning the sweet-briar, I can only recall these lines from Shakespeare and Chaucer—these two who are never coupled. They are not the *two* greatest in our poetic literature, but to me they are the greatest, and one I worship and the other I love. Alike in their all-embracing view of humanity and power of characterisation, they are yet wide apart as East from West in spirit. One would say off-hand that the contrary of this is the truth; that they are alike in spirit, since only in virtue of great sympathy and love for their fellows—with the insight that comes of genius—could they have produced all that crowd of wonderfully true portraits that adorn their galleries.

Nevertheless, to me they differ essentially in feeling. It was sympathy and love with insight in one, and pure intellect with simulated sympathy in the other.

There's Hamlet sickened o'er with the pale cast of thought, and there's gross Falstaff with his rapscallion followers and his old friend Justice Shallow; and there's Malvolio and Richard the Second, and passionate Romeo, and the melancholy Jaques, and old crazed King Lear, and many, many more. They are an immense crowd, for they have now come down out of their frames or books; they are of flesh and blood, and I am walking among them as among old friends and acquaintances. But where is Shakespeare all the time? I find him not, in spite of all the loud triumphant shouts of those who have discovered him in this or that character and exposed his true inwardness to the world. He hides from, he deludes, he mocks us, until we come to regard him as a mythical being or a demigod.

Chaucer revealed himself in every one of his creations, in every line he wrote. If he has a fault as an artist it is that he is too human; the sense of kinship, of brotherhood, is, however, more to me than artistry, even of the godlike aloofness of Shakespeare. Can we in all our literature find one like him in this, a blood relation to all men, good or bad, from the lowest human refuse to the highest, the kingly and saintly? He is one of them always, and eats and drinks and laughs and weeps and prays with them. All the others whose works are a joy for ever are now dead—dead and gone, alas! we know it when we read them. Even great Shakespeare and his fellow-Elizabethans, with all those who came after—the heroic, the fantastic, the metaphysical, with their tantalising, fascinating conceits: and succeeding them, the smooth, the elegant, the classical, who reigned a hundred years: then the revolting romantics in a more than century-long procession down even to the spasmodics, whose *Balders*, *Festuses* and *Aurora Leighs* our one immortal critic would have described as a relapse into a romantic savagery more offensive to common sense than the fantastic conventions of the seventeenth century: and finally the Victorian giants who long survived these offensive ones—great Browning, cheerful in his white tie and shirt front; Tennyson, now under a cloud, sad and prophetic like the Druids of old, with beard that rests on his bosom; and last to follow, Swinburne, tattooed all over with beautiful female faces in rainbow colours, still valorously piping on his shrill everlasting pipe. Dead—dead are they all! But if you think of Chaucer as dead you are greatly mistaken; and when you read him you need not reflect mournfully, as you would in the case of another, that he no longer treads this green earth; that he who was most alive and loved life more than all men is now lying in the coldë grave, alone, withouten any companie.

I know it, because I am so often with him, walking in many a crowded thoroughfare, watching the faces of the passers-by with an enduring interest in their individual lives and characters. But I appreciate his company and love him best amid all rural scenes, especially in early spring, when we together delight our souls with the sight of the glad light green of the opening oak leaves and the cold fresh wholesome smells of earth and grass and herbage. He alone at such times is capable of expressing what I feel. Reading Wordsworth and Ruskin, nature appears to me as a picture—it has no sound, no smell, no *feel*. In Chaucer you have it all in its fullest expression; he alone is capable of saying, in some open woodland space with the fresh smell of earth in his nostrils, that this is more to him than meat or drink or any other thing, and that since the beginning there was never anything so pleasant known to no earthly man.

All this about Chaucer will seem somewhat irrelevant in this inquiry to some readers. I don't think so; and even now, after all said, I am still reluctant to let go his hand. From the oak-wood I go with him to the open fields in search of early daisies, and with him kneel on the grass and bend down to kiss the beloved flower—the beautiful dead child Margaret, come to life and light again in a changed form. Or seated on a green bank, my hand on his shoulder, converse with him, and if he falls to talking bawdy or filth, for love of it, until he makes me sick, I am a little ashamed of this modern squeamishness, and am able to rejoice in his ranker zest in life, his robust humour.

And all this time I am seeking after something hidden. Does he, Chaucer, speak only for himself when he writes thus of daisies and the smalë fowlis with their melodie and the scents of earth and leaves and flowers, or is he expressing feelings which were more common in his day than in ours?

Here then, for the present at all events, I will drop the question.

It is rather unpleasant, after revelling in paradisaical odours with my ancient friend, who is more alive in spite of his half a thousand years than any man I know, to have to conclude this part of my subject with a somewhat disturbing matter.

When I first came to England I soon discovered that all scents on the male person, natural or artificial, were distasteful and even abhorrent to men. I had been kindly taken in hand by new-found friends who desired to make an Englishman of me—a respectable person. They told me to wear a silk hat and frock coat, tan gloves, and to carry a neatly-folded umbrella in my hand. They also instructed me to take in *The Times*. One of my friends, a nice old retired barrister, assured me that a man who had not read his *Times* in the morning was unfit to walk the streets of London. I obeyed them in everything, but when they objected to a little Cologne or lavender on my pocket-handkerchief I revolted. They said I had come from a semi-barbarous country and did not know all that this meant—that an English gentleman with scent about him aroused a strong feeling of hostility in others, and that it was considered very low and indicated a person of an effeminate and nasty mind. But as I had lived among semi-barbarous people and hobnobbed with savages and dangerous whites, I knew I was not effeminate and that nastiness was not in *my* mind. Their feeling about scents was an associate one. As boys they all herded in great schools and universities, and when the time came for the restraints to be relaxed they went out to "see life," and seeing life with them did not mean mounting a horse and riding forth in quest of adventures; it simply meant going up to London or any other big town in their neighbourhood, where they placed themselves under the guidance of those who knew the ropes, and who took them to the haunts of people they had never encountered before, people who were not respectable, chiefly women who received them with ravishing smiles and open arms. These women have the habit of scenting themselves somewhat excessively, and the scents and the women and their haunts, and the people and life altogether, became associated in their young impressionable minds. By-and-by the revulsion comes, respectability and the serious business of life call them back, and they shake themselves free, but, alas! not free of the vile associations which all perfumes have for them for the remainder of their lives.

It may be that this feeling, a sense of disgust, in the gentlemen of this island country is of modern growth. At all events, we read in books that in the eighteenth century, down even to the early nineteenth, when the gentlemen visitors made their exit from a drawing-room, backing gracefully out and bowing low in the elegant manner of those times, they invariably left the scent of pomander behind them.

A couple of centuries earlier takes us to a time when an Englishman could saturate himself with perfumes as readily as any Venetian lady of that period; when a gentleman could call on his apothecary to get him an ounce of civet (a large order in those days) just to sweeten his imagination.

From associations which degrade something which is lovely in itself we will go on at once in conclusion of this chapter to those which exalt, and the use of perfumes in religious symbolism. Let me first, however, refer to the word *spiritual* as used a few pages back in describing the perfume of certain flowers. That it has been used by others in this connection I don't know: it would surprise me to learn that it hadn't. Nevertheless, I must say something in elucidation of my private meaning.

Spiritual, as here used, refers to a scent, or to a quality of a scent, which differs in character from all these flower-odours described as sweet, delicious, luscious, rich, lovely, luxuriant, etc.—the scents, in fact, which in some degree are suggestive of flavours; differing too from all fragrant gums and woods, spices and the aromatic smells of leaves; also from all artificial perfumes and scents distilled from flowers. You may capture and bottle a rare or spiritual perfume, but its chief virtue, its highest quality, will vanish in the process. That can only be had from the living flower.

Spiritual, then, in the flower-scent means an effect on the mind, one we are already familiar with; we find it in certain human faces, in their expression, in human voices too, in some moods, in speech or song, in certain flowers in their appearance—never, perhaps, in any brilliantly-coloured flower—in certain bird sounds; it may be in a certain note or phrase of its music; also in other non-human things, even in the inorganic world, as in certain aspects of earth and sea and sky in certain rare atmospheric conditions.

Finally, it is a more ethereal scent than those of other flowers, therefore more evanescent, yet more penetrating, touching the mind, as we imagine, to something more than a mere æsthetic satisfaction.

We know how great a part association has in the pleasure we receive from lovely things—sights, sounds and scents; it may, indeed, be the chief cause of the effect produced by those rare and delicate scents we have been considering; but I don't think so. Anyhow, it is doubtful: thus I may at any time find that peculiar effect in a wild flower never previously met with, growing in some desert place.

With frankincense it is a different story: it is one of the thick or heavy perfumes of the fragrant gums which do not suggest flavours, but are also far removed in character from the etherealised quintessential flower-scents described as spiritual. The effect, therefore, in religious ritual is mainly due to association, and it is a very powerful effect, and no doubt it was much more potent in the Ages of Faith than now, and it was this use of frankincense which gave rise to that common belief in lovely and heavenly perfumes emanating from the long-buried bones and corpses of dead saints on their exhumation. Intellectually, we know, smell does not rank so highly as the two other senses, but it is, on the other hand, more emotional, and stirs the mind more deeply than seeing and hearing. It has, as it were, a higher and lower nature, and only in the lower does it come near to taste; and *taste* even the Protestant, full of dry light as he is, yet admits into *his* religious symbolism. But he cannot attend a Roman Catholic church or cathedral service in the reverent spirit of one who looks on all churches as God's House without feeling its effect, and recognising its peculiar fitness in spite of the want of association for him in that cloud of incense; and he may even think that he has been wrongfully deprived of something desirable and of value in his own church service when he remembers his Bible, which is perhaps his fetish, and the words of the Being he worships, when He proclaimed through the mouth of His prophets that from the rising of the sun to its going down incense would ascend to Him, morning and evening, in all places.

Why then is incense not used in the Anglican Church, which took its ritual from the church before it? Nobody knows. The histories only tell us that it began to fall into disuse in the reign of Edward VI.

There I will leave the subject, which I confess is rather an out-of-the-way one to bring into a book concerning the senses of man and animals by a field naturalist.

VI

The idea of unconscious smelling and the light it lends—Effect of rest on nerves of smell: in caverns; at sea; on mountains—Character of a dog's smell—A friend's surprising experience—Racial smell—Smell a low subject—Physiology—Man-smelling by savages—Atavism and a man whose nose never deceived him—Cheek-smelling by Mosquito Indians—Case from Dugald Stewart—Estimating character by scent—The dog's nose in judging character—Effect of human odour on animals—Wolves in the Zoological Gardens—Wolf-children—The jaguar's beneficent impulses—Bear and puma—The mystery explained.

YEARS ago—fifteen or twenty, I believe—in reading an article in a periodical on the progress of Science, or some such matter, I came upon a brief account of a notion put forward by a German scientist about the sense of smell in man. This was that the odours of which we are unconscious do yet serve to inform the mind. Thus, when we conceive a dislike or repulsion to any person, a stranger to us, it is because he has a bad character or disposition or is for some reason antipathetic to us, and this is revealed to us by his smell.

This notion appeared to me unbelievable and even somewhat fantastic, as I was then quite convinced that it is solely the expression of a new face which reveals the character of the person. Consequently I thought no more about this theory, which does not seem to have received much, if any, attention in any quarter. Now, years later, I find that it throws a sudden bright light into a dim interior in which I had been helplessly, hopelessly groping among vaguely-seen mysterious objects or shapes standing or moving about me. Let me hasten to say that it was, and is, a vast interior, that the sudden light fell upon and revealed only a small number of the dimly-seen shapes about which I must write by-and-by, but I think a good deal must be said first by way of clearing the ground.

We may take it that every object about us, animated and inanimate, has a smell, although our olfactories may not tell us so. We have only to consult a dog to know that the atmosphere teems with scents to which we are insensitive. But we find that by giving a holiday, an idle time, to our olfactories, they recover in some degree their lost or hidden power. Thus, it is a well-known fact that when a person has spent some hours in a deep cavern, like the famous Mammoth Cave in Kentucky, where in the great rocky chambers, miles under ground, the still atmosphere is free from scent particles, on emerging his nostrils are assailed with a hundred smells—of the soil, of trees and bushes and grass and every object around him. So sharp is the sensation that it is actually painful in some cases. Again, on landing after a sea voyage, the smell of the land and of buildings is quite powerful, and we smell things strongly too when we come down from a mountain. Even after a day spent on the crest of the South

Downs, where I used to take my walks, the various strong smells of the earth and vegetation, and of the village, would come as a surprise and amuse me with the notion that I had recovered a long-lost faculty.

Undoubtedly there is a very considerable difference in the smelling powers of different persons, but the difference appears greater owing to the variety of conditions in which we live, and to the fact that if we live with smells, however pleasing or disagreeable they may be when newly met, we become unconscious of them. I think of the dog's smell in this connection, and note that when I speak to my friends about it they invariably asseverate that the dog, if clean, has no smell at all. The fact that you see dogs in the arms of half the ladies who are out for a drive in their cars, that you find them everywhere in drawing-rooms, not as casual guests, but residents there, as a rule in possession of the most comfortable seats in the room, is taken as a proof that they have no smell. Having become unconscious of the smell themselves from living in it, they imagine it is so with others. Out of doors a dog has no smell for me unless he gets too near by throwing himself on me and trying to lick my face. But in a room I am as conscious of his smell as I am of the smell of a fox, or of rabbits or sheep. It is to me a disgusting smell, and if asked to describe it, I should say that it is a carrion smell; not the smell of carrion lying or drying in the sun, but of a dead animal lying and decomposing in a pool of water in hot weather. Long experience in a wild cattle country, where during the summer droughts old and feeble beasts are always getting stuck and perishing in the muddy water-holes, enables me to make these nice distinctions. It is *the* dog smell, and I find it even in the petted lap-dog, fed delicately and washed and brushed regularly every day by his attendants.

Here I will give a personal experience which illustrates the different way in which the sense of smell affects us, according to our way of life, predilections, and so forth. I went to visit a venerable lady of my acquaintance at her country house, and was told she was laid up with an attack of bronchitis, but wished to see me, and I was taken to her room accordingly and found her in bed, propped up with pillows and breathing with difficulty. Her two favourite dogs, black or dark-grey haired shaggy terriers, were lying on the eiderdown quilt at her feet. Doors and windows were closed, and though it was a large room, the peculiar dog smell described a few lines back was strong enough to make it exceedingly uncomfortable. But she, I knew, was unconscious of it, and I did not venture to suggest the advisability of opening a window lest, coming from me—one, to her thinking, so ignorant and prejudiced as to regard dogs as unclean animals—it should appear like a reflection on her pets. Then the housekeeper came in to consult her about some household matter. She was a stout, or perhaps fat, sonsie little woman with a bright smiling face, and in the light muslin dress she wore looked delightfully cool and fresh—almost flowery. She remained about a minute and a half in the room, standing some distance from the foot of the bed, then withdrew, and no sooner had she closed the door behind her than the sick lady begged me to throw open the front window—wide open to let in plenty of air, as she felt suffocated. Then she added in explanation that she always felt like that when a fat person came into the room; the smell of fat people was intolerable to her!

Many and curious as are the tricks our olfactories play us, I was really surprised on this occasion; but my surprise was nothing to that of a friend of mine at an experience he underwent. He had never previously given a thought to the subject—the smell of the human animal.

He was a young army doctor in India, and at Bombay, his duties being light, he zealously set himself to win a good private practice. He made himself well known in the society of the place, and his servant had strict instructions to come always into the church where he attended Sunday morning service to call him out to a supposed urgent case.

The natives just then were in a state of political excitement, and he was desirous of finding out all he could about their aspirations, intentions, and so on. One day he told his servant that he wished to attend a big meeting about to be held in a quarter of the town he was not well acquainted with, to listen to the speeches of the orators, and he asked his man to take him there and get him admitted. Accordingly they went on an oppressively hot evening, and he sat in a huge densely-packed hall for about half an hour, then came out. After taking a few deep breaths he exclaimed: "What a relief to get out! In another ten minutes I should have collapsed. The smell!"

To which his servant promptly replied: "Ah, Sahib, *now* you will understand what I suffer every Sunday when I have to go right to the middle of the church to call you out!"

Never, he told me, had he been so astonished, so flabbergasted in his life as by this speech, and he could only stare in silence at the man. The extraordinary readiness, the candour, the spontaneity, and even the glee, with which he brought out his words made it impossible for his master to doubt his perfect sincerity. He had taken it for granted that his master *would* understand, and after his own unhappy experience at the native meeting would be ready to sympathise with his servant's sufferings in the performance of that painful Sunday duty. But what an amazing revelation it was! How almost incredible it seemed that a congregation of English ladies and gentlemen, fresh from their morning's ablutions, in their fresh clean clothes, should offend the natives of the country with their European or Caucasian smell, even as they offend us! And what did it mean? Why, that we white-skinned Westerns, lords of creation, have our smell just as the blacks and bi-coloured races and the lower animals have theirs; that we are unconscious of this fact with regard to ourselves—our own race—but are quite conscious of it with regard to the others. And he, a doctor, proud to think himself of a scientific bent of mind, a student above everything of the human subject—how had it come about that he had overlooked so important a matter, that he was so grossly ignorant about man's sense of smell? That others were just as ignorant he soon found, nor could he get any enlightenment from such books as were accessible to him. But he still kept the matter in his mind, and a few years later when he retired from the army and came home to settle down near London, one of his first steps was to go to the British Museum to look the subject up. But for all his looking he could find nothing. "It is," he said, "a neglected subject, and some day I may be able to write a book on it, as I have some very curious facts I picked up in India to begin with."

And that's all, alas! When I hinted that it would interest me to hear something about the curious facts he had picked up, he didn't respond. At present, he said, his mind and time were wholly taken up with certain pathological problems which had a singular attraction for him, and he was deeply interested in his work at the hospitals, so that the subject of smell would have to wait a year or two, or three.

Two or three years later he died.

The moral of this story is that it is useless to try to "look up" the subject of the sense of smell in the libraries. One must shake off the oppression, the curse of books, the delusion that they contain all knowledge, so that to observe and reflect for ourselves is no longer necessary. It is all there—all we want—in the British Museum, so that these special mental faculties have, like the sense of smell, ceased to be of any use to us.

It is not literally true that the books say nothing on the subject; they do say, or those I have consulted say, that it is an obscure subject, that the sense of smell is a low sense compared with sight and hearing, that it may be classed with taste, that smell is, in fact, "taste at a distance," that when you look into it you find you have got hold of a rather low subject which had better be dropped. That's the sum and essence of the wisdom on the subject contained in the books.

As to the physiology of the subject, you can have as much as you want so long as you are satisfied to study the organ and to know nothing about the function. Perhaps not quite as much as you want, since we are told that it is not yet known if the sense of smell depends upon physical or chemical processes. But what they do tell us is wonderful enough; for it is the fact that these "nimble emanations," these infinitesimal scent particles, do not, as in the case of the sense of taste, come directly in contact with the nerves of smell, but indirectly, through a medium. The nerves exist, or live in, or under, a liquid, and when the scent particle falls into this liquid, it dissolves, thus making an infusion, as it were, which the nerve *tastes*. One might compare the bed of nerves forming the olfactories to plants—watercresses, for example, growing in their water-bed, as we are accustomed to see them in cultivation—and the scent particles to snowflakes falling upon and dissolving in the water. The snowflakes, we may say, have different qualities, according to their chemical composition or elements, and these elements produce the various stimulating effects on the plants they come in contact with.

It strikes me as a roundabout or cumbrous way of getting the effect; that it might do in the case of a man or rhinoceros or dog, but in the case of the infinitely more subtle scent in the insect it could not possibly work. Probably it doesn't.

But I must not go into that imperfectly-known, fascinating insect realm, since the subject we are just now concerned with is man's sense of smell, and of man smelling man.

That we are not conscious of the smell of people about us is not evidence that it is the same with primitive races; nevertheless, I conclude from my observation of both man and animals that savages are not conscious of the smell of those they consort with, except at certain times, as, for instance, after being separated from them for some time, but that they are always conscious of the smell of a stranger. Also that the mother knows the smell of her own babe, and that there is a double advantage in this—the smell stimulates her maternal feeling and prevents infants getting changed by accident, which would otherwise sometimes happen, as the children of savages resemble each other so closely.

No doubt there are many instances in smell, as in other senses and faculties, of atavism; they would tell us much, but unfortunately they are not recorded.

I have heard of several; one of a man who was distinctly conscious in a disagreeable way of the smell of others; it was told to me by a friend who knew the man and had talked to him about his acute smell. My friend lived in a mining town in Wales, and the man came there from London, sent by his employers to act as their agent, and to reside most of the time in the place. He was anxious about his lodgings; it was necessary that they should be scrupulously clean and the landlady an exceptionally trustworthy person. Having found just what he wanted, he settled down for a few weeks, and was then called to London by his employers, who wanted him for a few days in town. Before going he called his landlady and charged her solemnly not to admit a stranger into his rooms during his absence: they were his rooms which he paid for, and he would not have them used by another. She assured him with some show of indignation that it was a thing she never did, that it was against her principles, and the rest of it; but after he had been gone a day or two she was prevailed upon by someone who knew the house to let him have the room for one night. A week later the man came back, and had no sooner entered his bedroom than he shouted to his landlady and asked her how she dared to allow a stranger to sleep in his bed! She denied it, and in his anger he called her a wicked liar, since he knew perfectly well what she had done. "How do you know?" she demanded. "By the smell," he replied. "The whole room smells of the fellow you have had the impudence to put in here. My nose has never deceived me yet!" And in this way he went on until she gave in and confessed her fault, and promised never to offend again.

I imagine that if we were to tell this case to a dog gifted with speech and as intelligent as dogs are taken to be by their masters, he would exclaim: "Well, I never!" His surprise would not be at the man's keenness of sense, as that would be a small thing to him, but at his fastidious dislike of the smell of a fellow-being.

One other instance will be given here, not that it is more remarkable than the others, but because it has come in my way just now—in fact, after these chapters on smell had been written.

I was at afternoon tea with others at a seaside house when a lady came in, followed by her white Skye terrier who attends her in all her walks abroad. The dog and I had been acquainted, but it was now over nine months since we had met. After looking round and noticing some of the others, he came up to me and began smelling at my feet and ankles and legs up to the calves, and not only sniffing but pressing his nose against my legs. And this I supposed was because I happened to be wearing a new pair of trousers, and the smell of the new cloth without the human smell in it cut off or obscured that of the flesh behind it. After examining me in this way he looked up at me with a pleased expression in his face and vigorously wagging his tail. That was to say that he had succeeded in identifying me as a friend, and that he was very pleased to meet me again.

I called the lady's attention to her dog's action, and she said it reminded her of a little sister when they were young girls together. Her sister's sense of smell was curiously acute, and when they would come in from a walk and saw a lot of hats hanging on the hat-rack, her little sister would take them down one by one to smell them, and by smelling them identified the visitors.

Napier Bell, in his *Tangwera*, the autobiographical account of his early life with the Mosquito Indians in South America, relates that after all the men of the village had been absent some days on a fishing or trading expedition, on their return they would be received with demonstrations of delight and affection by their women. They would embrace and smell one another's cheeks, first one cheek then the other; but they never kissed. He also gives translations of some of their songs of love and affection, in which, in speaking of the loved one, they always mention the nice or pleasant smell of the skin: "I remember the smell of your cheek," and so on.

It must be noted that the attractive smell was not that of the odour glands in a woman's mouth, since they never kissed, but was, as they said in their songs, the pleasant smell of the skin of the cheeks. They were then, we see, distinctly conscious of the smell, and it need not be considered a fanciful conclusion that the temper, the feeling of love and affection at certain times, gave the agreeable character to it.

Another equally important fact bearing on the subject under discussion is given by Dugald Stewart in his account of the boy James Mitchell, who was born blind, deaf and dumb, and was wholly dependent on his sense of smell in his intercourse with others. He would instantly become sensible of the presence of a stranger in the room, and *would form his estimate of the person's character from his smell.*

This is not the only case of the kind on record, but it is the most striking one, and to my mind it does give support to that notion of our unconscious smell as being concerned in the estimate we instinctively and instantaneously form of the characters of those we are brought in contact with.

We may say that Mitchell, deprived of his two most important or intellectual senses, and dependent on smell and touch, was reduced to something like the position of the dog in relation to other beings, the dog of course having a considerable advantage in the possession of sight and hearing. The chief interest in this case, however, is in the power of estimating the character of those who came in his way by the smell. Let us see then how it is, in this matter of judging by the smell, with the dog.

Let us take the case of a dog that is not wholly parasitical, a parlour or lap-dog with his faculties dimmed or atrophied, but a natural dog who lives much out of doors, yet is free to come and go as he likes in the house—a lively, frisky, active dog, with all a dog's curiosity in the people from outside who come into the house, known to him or strangers. He drops in at five o'clock, let us say, to find the drawing-room half-full of callers scattered about the room, conversing and drinking tea. He too has been thinking of his tea, but before attending to his own wants he goes about among the guests, smiling, so to speak, at those who are of the house, greeting others who are callers but well known to him, but looking and sniffing very attentively at the strangers. But it is a mistake to speak of his looking at them; he sees them so vaguely, so dimly, his whole attention being taken up with the new smell which he finds in each. His nose, pointed at them, has the nervous twitching seen when a scent deeply engages him, and at the same time there are little nervous bodily movements which show that he is somewhat excited. And we see distinctly—I have seen it in scores of instances—that he is, in his lowdown dog mind, actually investigating and estimating character according to smell. For you will observe in some instances, after the little sniffing performance, a sudden change in the attitude of inquiry and suspense, and this may be a quick aspect of friendliness, a tail-wagging, a look up at the person's face, a nearer approach, and those movements of the ears and forehead and mouth which undoubtedly show that the person is pleasing to him; or, on the other hand, the sniffing with a slight recoil, a look as if a menacing gesture had been seen, and a quick movement away from the person who has not been liked.

This fact, which millions of persons must have observed in their time, is worth putting on record, but comment would be idle, since in this matter we don't quite know what the dog's standards are, or whether in "estimating character" he smells nose to nose with man. All we do most certainly know about the dog's sense is that he dotes on carrion smells and dislikes the odours we take delight in. It may be, however, that the smell emanating from the good and loving are grateful to us all, dogs and men, and in like manner that the emanations from those of evil minds, who hate rather than love, or who have criminal instincts, are repellent both to man and beast.

The human smell sometimes has an ameliorating effect on other animals besides the dog, but most of the cases one has heard of relate to the dog and his relations, and I first think of the wolf in this connection.

A friend of mine told me of a strange incident at the Zoological Gardens during his visit one day there with his three boys. There were three wolves in the cage at that time, and as soon as he and his boys placed themselves before the cage all three animals became wildly excited at the presence of one, the youngest of the three boys. As the boy moved along they followed, straining against the bars to get nearer to him, their eyes shining, their mouths open, and tongues lolling out. They were in a state of intense excitement, and were all continually jumping up and standing on their hind legs to get a better view, nor would they allow their attention to be diverted for a moment from the object of their regard.

At first the visitors, both father and boys, were greatly amused, but the excitement of the animals was so great that by-and-by the boy began to get frightened, and his father thought it best to take him away. As he did so, the wolves rushed to the end of the cage, and standing up and pressing against it, gazed longingly after the boy. An hour later they returned to see if the animals had recovered from their excitement, but the moment they appeared all three wolves were up again, as excited about the boy as before.

What did it mean? my friend asked me. Did they want to devour the boy?

I thought not. My answer was that, according to his own account, the animals seemed to have been in a joyful and affectionate rather than a savage, devouring mood, but what it was in the one boy that put them in such a state was a mystery to me.

Years later, and not long ago, I witnessed a similar demonstration on the part of two wolves in a cage, one, if not both, the Canadian timber wolf, the biggest of all the wolves. They became extremely excited at the presence of a child who came close to the bars, their tongues lolling out, and straining as if to get out and caress the child with their tongues.

Here is an account of a similar incident from Australia:

> The writer went with his wife and two little children, aged two and four, to the Royal Park at Melbourne, where the wild animals are kept. There they came upon a cage with four wolves lying stretched on the ground. These took no notice of the writer, his wife and elder child; but the moment the younger one toddled up they sprang simultaneously to their feet and made for the corner of the cage nearest her. Not content with this, two of the largest stood on their hind feet and pressed themselves hard

against the cage, pushing their forepaws through the bars towards the child as though to get near her, wagging their tails and barking frantically the whole time, their eyes riveted on her. As she moved away they rushed across the cage to the other corner and repeated their actions. Whenever the child uttered a word or two it seemed to affect the wolves powerfully and made them redouble their efforts to get near her. And later, on returning to the cage, the same thing happened again.

The only imaginable explanation of these occurrences is that it was the smell of the boy and the two other children that excited them, and as the excitement was a joyous one, it must be supposed that there was a quality in the smell in each case which " touched a chord," to put it in that way, in the wolf's nature. Furthermore, it was a quality which the animal instinctively and instantly recognised, a something important in its life, a stimulative to the parental passion.

In the relation between parents and offspring in the mammalians, smell plays a most important part, as sound does in birds. These wolf incidents inevitably remind us of the ancient legend of Romulus and Remus, but the now numerous authentic cases reported from India have sufficiently proved that the wolf-child is no mere fable or fancy. Mammals, we know, keep with and safeguard their own young and pay no attention to others; but there are many exceptional cases, both in birds and mammals. The call or hunger-cry of the orphaned birdling is apt to meet with a response, while the mammal is capable of being deluded by a simulating odour.

Apart from wolves, we find certain cases, called by Humboldt " instances of beneficent impulses in the most savage beasts which cause them to act contrary to their natures." This was his only explanation of an astonishing incident he heard in South America of two children playing with a jaguar in the forest, and the animal playfully responding to the mock attacks they made on it. It is curiously like the incident related in Atkinson's *Travels in Siberia.* In this case a woodcutter and his wife returning to their cottage missed their two children, a boy and a girl, and in great alarm they went out to look for them. Hearing shouts and laughter they hastened to the spot, and were horrified to see a big brown bear looking very happy with his tongue lolling out, and the woodman's little boy sitting on his back trying to make him go, and the little girl pulling at the bear's head. At a shout from the man, the bear shook the children off and trotted away into the forest.

It is hardly necessary to say that the great Humboldt knew little or nothing about the animal mind, since it can't be measured with a foot-rule or weighed in a pair of scales or analysed. But the scientist rightly considers that his mission on earth is to explain everything, and when he can't find an explanation, to substitute the precious illuminating word or phrase; hence the tiger's "beneficent impulses."

Finally, we have the still more remarkable case of the puma, the lion of South America, a powerful, ferocious cat, destructive to cattle and horse, sheep, goat and pig, but never known to attack a human being. The Argentine gauchos call him the "man's friend," or the "Christian's friend," and assert that he would not attack a sleeping child found in the desert, however hungry he may be.

In all these cases, as in that of the wolf and wolf-child, the explanation is the same—the savage beast has been disarmed by the scent of the person. In the case of the jaguar and the bear, we can only say that there was a quality in the odour of the children which stimulated the parental passion. The case of the puma is more difficult, but here too it can only be supposed that some quality in the human odour has the effect of overcoming the rapacious instinct.

We may suppose that the odour suggests one that is familiar and grateful to the animal; it may be the odour of its young or something else; impossible perhaps to discover, as in the familiar case of our domestic cat's love of the smell of valerian.

VII

Little knowledge of savages available—Observations on the lower animals—Nose-greeting in animals—Smell in savages—Our unconscious sense of smell—Gypsies and savages on a level—Nerves of smell—The dog in his world of smells—Small woodland beasts in their world—How we are moved by hidden causes—Antipathies—Classical cases and modern instances—Antipathies and second sight—A strange case; clairvoyance or sense of smell?

IT may seem unfair, after announcing my subject to be the sense of smell, conscious and unconscious, in man, that I have still kept on about the lower animals. I can't treat the subject in any other way: I need their help all the time. Doubtless there's a great gulf between us and them in the higher mental faculties, but apart from that there is no gulf at all; they are, as we have been told, our poor relations, and like all poor relations they are always ready to remind us of our own humble origin. I do think it would be well to examine these questions among the lower races of mankind; but I can't do it myself, and most persons who have the opportunity of going among savages and primitive tribes have their minds occupied with other matters. It is possible, as Frazer has shown us, to write a cart-load of books about their folklore, legends and old religious beliefs, without letting us see and know them as they are, and how they compare with civilised Europeans in their faculties and instincts. My own opportunities were never good enough to give me a proper knowledge of these things: I was never long enough at a time in the company of savages to get through the outer crust. It takes a long time to know them properly, even for one who is a good observer, whose mind is ever on the watch secretly, and who in this way takes in knowledge unconsciously as he inhales the air. This I have been able to do with the lower animals, and to them I must continually look for support as I proceed.

To go on, then, in this same way. We note that animals greet one another by putting their noses together, sometimes touching or rubbing noses, as in the case of horses; but in most animals they merely sniff, first the nose then the face generally. They are pleased, as it would seem, in recognising the familiar smell of a friend: and when they meet as strangers, as we may see every day in our horses, they exchange nose-greetings just as civilised men exchange visiting-cards. No doubt men, too, in the early state of culture, took smell of one another when meeting as strangers; and I imagine that the nose-rubbing performance in some tribes is nothing but a survival of the face-smelling custom or instinctive act.

Nor is the deliberate face-smelling custom wholly obsolete to-day, as we have seen in the reference to the Mosquito Indians in the last chapter. A single instance, it is true, but an extremely valuable one. As a rule, the aboriginal American does not exhibit emotion of any kind. His stolidity or indifference is, however, in some degree a convention, a mask, which he seldom neglects to wear in the presence of strangers, especially in that of a white man, who possesses strange and dangerous knowledge and looks down on him. But I think he can smell a stranger as well as see him, and is distinctly conscious of the strange smell. That he consciously smells his own surroundings and people all the time is not to be supposed, since the smells we live with cease to affect us. He can smell his people when he has been absent from them for a time.

We can understand this—the conscious and the unconscious smell—in our own every-day experience. Thus, when I come into a room in the morning I smell it, a distinctive smell different from that of other rooms, according to the furniture in it, the wallpaper, or paint, or whitewash, and the flooring, wood, stone, or carpet. If it is a room I work in I cease after a few minutes to smell it—I become unconscious of its smell; but on my return to it I find it again, the familiar welcoming smell.

Whenever, here in England, I come into contact with gypsies and sit by their camp-fires conversing with them, it always affects me like an old familiar experience, because they are psychologically so much on a level with the uncivilised Indian. The gypsy has succeeded in fitting himself into a place in the midst of a people of another and higher race because he has a subtler mind than the western savage, and the subtlety or cunning is either the result of long ages of training, or was innate, he being a migrant from India or Egypt, as we suppose. He is, like the cat, still himself unspoilt by contact with a higher sort of humanity; that mysterious gift, that wonderful secret forever hidden from our duller brains, which Glanvil's and Matthew Arnold's "Scholar Gypsy" wasted his life in seeking after, may after all have its seat—or vestibule—in the nose, and, for all we know, the nerves of smell may have become specialised in a peculiar way in his race.

It is true the physiologists tell us that there is nothing to indicate any specialisation in the nerves of smell, such as exists in the nerves of taste; they believe that the olfactory nerves are all alike, with one function, which is to respond to the stimuli of all sorts of smells, from the most agreeable to the most disgusting. One can only say that this is not quite satisfactory; that when we cease to smell our surroundings consciously there may be a distinct set of nerves that take up the task, so to speak, and receive and transmit sense impressions we are not sensible of.

Here I come to a subject which no town-born reader will understand or take to be more than a fancy of the writer's: nor could it be otherwise, since, owing to the artificial conditions he has existed in, his olfactory nerves have been blunted and to some extent even atrophied.

Let us first go back to our old friend the dog. We see how he conducts himself when we take him out for a walk, how he is at once in a world of smells of which we know nothing, which so occupy or absorb his attention as to make him practically blind to everything about him and deaf to all sounds, even of his master's voice impatiently calling him to "come on." He must first investigate the smell he has stumbled upon, and perhaps disentangle it from several other smells it has got mixed up with, before his curiosity is satisfied.

Now take him into a still wood, abounding in wild life, and make him lie down quietly at your feet and watch him. He knows that he must obey the irksome order, and closes his eyes and pretends to be asleep; but he is awake, in a bath of emanations; you can see it in the perpetual twitching of the nose, and from the nose the suppressed excitement flies all over the body. But all you see in your fox-terrier or other outdoor dog with the hunting instinct kindling to hot fire in him is little enough to what appears in any small wild creature you may observe in repose. The small wild woodland beasties on any bright sunny day in autumn and winter, especially during the first half of the day, like to come out of hiding to take a sun-bath. Moles, squirrels, hedgehogs, bank and field voles and wood mice—any one of these may come up or out in sight of you, when you sit perfectly still for a long time. The little creature comes from its den or hole at the roots of a tree, or from under the bed of dead leaves, and settles down within a yard or two of your feet, perhaps. But it is best, on account of the disturbing effect of a strange smell so close to it, to see it fifteen or twenty yards away, and with your binocular to bring it within a yard or two of your eyes.

You will see that, as in the dog, the little nose is perpetually in motion; it is all the time sniffing at fleeting, elusive smells; also that he has a more exquisite sensibility than the dog. Watching his little tremors, his shiverings and quick little starts, the wide opening of his eyes and rise and fall of the hair along the back, with other minute motions extending from the nose—which is exceptionally long in the shrew—to the tip of the tail—which is longest in the wood-mouse—you would imagine it to be the frailest thing in existence, made ot nothing but nerves, trembling to every breath like a bit of thistledown, and to be blown away by a breath or killed outright by a snap of the fingers. And it is the smells and their character which cause it all—smells familiar and harmless, smells unknown that excite curiosity and suspicion, smells dangerous that startle, but are perhaps too faint, too far away, to cause the little creature to forsake its sun-bath just yet.

It will come as news to many, perhaps to most, readers to be told that we too, human beings though we be, are capable of being moved in the same way, though in a comparatively faint degree, from the same causes. Those of us, that is to say, who have lived an outdoor life, who find their chief pleasures in woods and in all wild and solitary places, and are alert and responsive to all natural sights and sounds and odours. To such persons, to sit still in any silent green place, merely to watch and listen, is peculiarly grateful, even when there is nothing living to see—not a jay nor a wood-mouse nor even an insect. And the chief pleasure or fascination of these restful intervals is in the seemingly causeless motions in himself—the person sitting still and thinking of nothing. They come to him; they touch him as if a small insect or spider, scarcely felt, had fallen on and run over his hand or face; and they pass through him and are gone, to be succeeded by others and still others like wavelets of air, producing effects that are like little thrills, tremors, minute nerve storms, as if he actually saw things coming and going before his sight, and heard faint mysterious sounds wafted to him from a great distance.

I take it that these movements in me are actually caused by the hidden life about me. The psychologist will say: "Oh, no, they are the effect of expectation, since you are watching and listening." That, indeed, is what I have thought myself; but the explanation was not good enough, since it did not fit the whole case; for it has often happened that when sitting silent and motionless in a wooded place I have fallen into a reverie, and my mind has been called back by these same little physical stirrings. I also find that I may sit as still and as long as I care to in any place barren of life without experiencing any such motions in me.

When it first occurred to me that these little nerve stirrings in me were caused by the presence of invisible living creatures near me, I formed the notion that all creatures have something—a force of some unknown kind—which affects us even at a distance of a good many yards, and in that belief I rested satisfied, finding comfort in it, until the idea of smelling unconsciously was put forward, which seemed to furnish a simpler, more understandable explanation. And this explanation must hold the field in my mind until a better one is found.

It is true that nothing definite comes of it—that these faint and vague intimations tell us only that life, breathing animal life, is there, but as to the nature of the life it tells us nothing. This may be because our sense, even that unconscious sense of smell which still survives in us, is too feeble now to produce more than a sense of a living something, we don't know what.

This may not be so in the case of primitive man, living a purely natural life—the life, let us say, of the Kyans in the forests of Borneo, the wild people of the Andaman Islands, the bushmen and pigmies in Africa, and the savages of Tierra del Fuego—who depend on their senses, smell as well as sight and hearing, for their livelihood and safety. But even with us, I believe that in some persons, in cases of atavism and in some pathological states, the lost faculty may be restored.

And here we come to the subject of antipathies—a subject ruled out by the makers of physiological and psychological books and from the *Encyclopædia Britannica*, which these same scientists edit—the people who do not believe in what doesn't exist, they having first made the rule that nothing exists which they can't explain or which does not conform to natural laws known to them. All the same we all do know that antipathies do exist, and have read of James I. and his insane terror at the sight of a drawn sword; of Tycho Brahe fainting at the sight of a fox; of Henry III. of France fainting at the sight of the harmless cat (our own Lord Roberts was almost as bad); of Marshal d'Albert fainting at the sight of a pig, and numerous other cases of a like kind—swoonings, convulsions and what not at the sight of this or that beast or reptile or insect, or at some inanimate object, or on touching some abhorrent thing. These are the classical instances which have been told in a hundred books, and what the sceptical scientist has to say of them I don't know, nor does it concern me, since I am not concerned either with the books or him, but in my own humble sphere, as field naturalist, I follow the light of Nature alone.

And what need is there for these old instances in books and the opinions of scientists, when such cases are continually cropping up or exist, or have been known to exist, in every parish in the country? If it had been necessary for some clerk or semi-official person to give an account of them in every village and town in the land, the records of half a century would in each such centre occupy a shelf full of books or annals. But it should also be the duty of the recorder to trace the antipathy, also other abnormalities, such as strange and monstrous births, to their origins, so far as they may be traced; and in most instances we know that they are the result of pre-natal suggestion.

The cases of people who fainted or went into convulsions at the sight of a pig or a cat remind me of an instance recorded a few years ago of a healthy, strong, working Devonshire farmer, who was affected in this way every time he saw a snake. He would stop, the implement would drop from his hand, and he would stand still trembling, the sweat pouring from his skin; and after some minutes he would slowly make his way home, and, throwing himself on a bed, lie like a log until the following day, when he would get up restored and go back as usual to work.

And this case serves to remind me of a better one, since I knew the man intimately from earliest childhood who suffered from an antipathy of this kind. He was perfectly healthy and normal in every way but this, and was a good fellow, although rather quarrelsome in his cups. Venomous snakes, spiders (and very big they were in that land), scorpions and centipedes were nothing to him, but the sight of a poor harmless toad—and toads were very abundant—would fill him with an extraordinary loathing and horror. He tried to explain the sensation produced on him to me, but could not, and all I could make out from his confused attempts at doing so was that it was a dreadful cold creepy sensation all over him, as if he were being changed into a toad himself. Also that he had experienced it from early childhood.

This subject of antipathies has been brought in here for the reason that in some cases the person thus affected appears to be endowed with an extra sense or faculty, like clairvoyance or second sight. Many such cases have been recorded (and here our Lord Roberts comes in again), but I will only mention one. This is the case of a workman who always knew when an adder was near him, even at a distance of several yards, and could locate the exact spot where it was lying. It is not stated whether or not the presence of the adder produced any disagreeable effect on him. When working with other men in the woods he would call the attention of his mates to an adder near them, concealed from their sight by trees or bushes, and would himself then turn aside as if to avoid seeing it or to see the others kill it.

Here again, in all these cases of supposed second sight, I prefer the simpler explanation of the sense of smell. To conclude, I will give here a very strange experience of "clairvoyance" in a person in a disturbed mental state, given to me by a friend, who will, I hope, pardon me for telling it, and be ready to testify to its truth.

My friend had been about four years a resident in London, first completing his studies then following his profession of an architect, living with his people in Kensington. One day, walking home, he saw a young gentleman in a side street in an excited condition, swinging his cane to drive off a number of street boys following and jeering at him. My friend, being of a chivalrous disposition, at once went to the young gentleman's rescue, and on coming up to him was astonished to recognise in him an old school-fellow and intimate friend of a few years back. He, after they left a public school in the North Midlands, had gone to Australia, and there had been no correspondence between them. He had recently returned to England and was living alone in London lodgings, and had probably been working too hard as his nerves were in a queer state. My friend at once offered to take him to his home to stay a week or two with his people, as he thought an interval of rest and pleasant society would set him up again. He gladly consented, and was presently received in the house and put in a large room which had not been occupied for a long time. Things went well for a few days, and their guest appeared to be quite happy with them, except when he had dark brooding intervals; then one day my friend heard noises as of violent blows in the guest's room, and going in to ascertain the cause, found his young visitor standing before a large cupboard pounding the panels with his fist. My friend caught hold of him and asked him what he was doing. "Doing!" he exclaimed, "don't you see what I'm doing—trying to smash this damned cupboard open where you keep human bones locked up!" He was wildly excited, and my friend began trying to pacify him, telling him that it was a most ridiculous fancy about human bones, that he had never seen a human bone in his life. By-and-by he quieted down, and my friend told him laughingly that he must get no more of such delusions in his head or it would make them very uncomfortable in the house.

He then left him, and quiet reigned for half an hour or so; then came a fresh outburst of noises, and returning to the room he again found his friend pounding and kicking the panels of the cupboard. Nor was he to be pacified even when his host told him that the cupboard contained nothing but his old sporting gear, his boots, blazer, caps, fishing-rods and such things, which he had locked up there years before, as he had no further use for them.

But all he could say was useless. "I don't want an inventory of your possessions," he returned. "If you don't know there are human bones in the cupboard, give me the key and we shall see."

But this key had been put away, and my friend didn't know where, but as he could not convince the other, he at last went off to see if he could find a key to fit this lock. Eventually he succeeded, and threw the door open and immediately began throwing the things out to convince his poor demented friend that there were no bones. The other stood by him staring in at the old school-day rubbish inside, when suddenly he dashed his hand in, and, seizing a leather bag, began struggling to open it. By-and-by he got it open, and there it was—a bag full of human bones! These were mostly bones of the arm, and right on top of the pile an entire skeletonised hand.

"Are you satisfied now that I'm not mad?" he exclaimed, pointing at the bones.

My friend said that he was never so amazed in his life. For some moments he stared silently at the bones, then suddenly the explanation flashed into his mind. He remembered that this room had been used occasionally for a short time by a younger brother, a medical student, who had gone abroad some three years before. He had used the room as a night study, and had no doubt got the bones from the dissecting room of the hospital he was at when studying the anatomy of the hand and arm, and had forgotten to remove them before leaving England.

It would not be possible to find a case more like clairvoyance than this. Just now, however, the whole question of that mysterious sense or faculty is, so to speak, on its trial, and the evidence does not go in its favour when we find that a majority of the supposed examples of second sight may be explained by telepathy. The case I have related was certainly not one of telepathy; it is, I believe, simply one of smell.

It may be objected that, allowing there was a smell, as there usually is from bones procured by students from the dissecting rooms, and that it escaped from the cupboard, there is still a big gap in the process to be filled in. How came the man to know that the smell, whether taken in consciously or unconsciously, emanated from human bones and not from something else with a smell? Most certainly he did not arrive at the conclusion by any conscious process of reasoning. *It came to him*, I imagine, in this way. The smell emanating from the cupboard was too slight to be noticed, but for all that it was taken in unconsciously and excited the subconscious mind, and the mind working on it advanced step by step to the conclusion: a smell pervading the room, emanating from a locked cupboard; identified eventually as the smell of bones; then finally adopting the conclusion that, concealed in such a place, they were most likely to be human bones. And this result, flashed suddenly upon the conscious mind in its abnormally excited state, brought about the half-mad outbreak.

VIII

An explanation and apology postponed—Smell in birds—An ancient controversy—The vulture's two aspects—The way of the vulture—Pigeons—Smell in crows—Daws and ravens—Carrion crow—The rook's double nature—An uncanny rook story—Panic fear in mammals—Horses and cattle scenting grass and water—Great stampedes preceding Indian invasions—Indian warfare in Argentina—A little frontier tragedy.

WHEN I ended the last chapter before quite finishing with all I had to say concerning the sense of smell, it occurred to me that I had touched upon certain subjects amidst which it behoves one to step warily. I mentioned antipathies, pre-natal suggestion, and in a chapter further back, even telepathy, and it then struck me that it would be best to make a long pause and introduce a digression which would occupy an entire chapter, and would serve once for all as my explanation and apology for introducing such questions in the book of a simple field naturalist. But after writing the chapter I thought better of it, and determined to keep strictly to the subject of smelling to the finish and drop the apology for the time being. At present I shall only say that these are delicate and controversial subjects, also that it becomes me in treating of them to express myself with the humility proper to an amateur, practically an outsider, one who is rightly anxious not to incur the displeasure of his masters in science and psychology, and of all those who have exalted themselves to the seats of wisdom.

So far I have said nothing about the sense of smell in birds; there is, indeed, little to say. Birds have the olfactory nerves, inherited from the reptiles, and the passages are mere slits in the horny beak, which they have in place of hands, and which serves them also as an implement, or rather as a whole box of tools—spear, hatchet, scraper, wedge, awl, spade or pickaxe, knife and fork and spoon. The anatomical ornithologists say that we know little about the smelling nerves of birds, except that they are degenerated and feeble compared with those of other animals, also that some birds have quite lost the sense. Nor is this to be wondered at when we consider the extraordinary development of vision in the bird—that the bird *lives* in his sense of sight as the dog, mole, and rat live in the sense of smell. The growth of one sense has caused the decay of the other. This at all events is the present view of the matter, but during the first three or four decades of the nineteenth century the question was discussed in the journals with all the fury proper to that early period, when passions were stronger and "language" more free than with us, and when if one naturalist differed from another about sight and smell in birds, he was frankly told that he was a fool if not something worse.

We smile at the chief argument of the smellists of those Waterton, Swainson and Audubon days: that when an animal died or was slain in the wilderness and stripped of its hide by the hunters, the effluvia emanating from it instantly flew abroad all over the land and rose also to a vast height in the sky, the result being that vultures would soon appear as if by a miracle in scores and hundreds where not one had been previously visible. Sight, they held, could not be the cause, seeing that a dead beast in a forest would not be visible to the soaring birds, except perhaps to one or two that happened by a rare chance to be in that part of the sky directly above the spot.

As in many another controversy of the kind, all that was wanted here was observation of the birds themselves by some field naturalist; this in due time was provided.

An interesting bird is this vulture in the two strangely contrasted aspects in which he appears to us: as the loathsome feathered scavenger in the one and the sublime heavenward soarer in the other, he might serve as an emblem of man in his double nature—the gross or earthly and the angelic. An ugly and disgusting creature as we are accustomed to see him in repose, gorged with carrion and dead drunk with ptomaines, his bald, warty head drawn down in between his huge projecting shoulders, his naked crop protruding, and his great wings like two frayed and rusty black cloaks thrown loosely round him. Then, when he has slept off the effects of his disgusting meal, he shakes himself, and the loose ragged cloaks are transformed to a pair of great outspread wings, which lift him from the earth and in ever widening circles bear him upwards, higher and higher still, until the vision can no longer follow him, or else he remains as a speck no bigger than a house-fly, still serenely floating in wide circles in the vast blue void. And at that height, far above the smells of earth, he will continue floating for long hours. He dwells on the air at that height because it is the proper height for him, the one which gives the fullest play to his faculties, to his vision, and the mind at the back of it. Invisible himself at that altitude, he can distinctly discern the objects it is to his advantage to see, the dead or dying or distressed animal, even as the gannet flying at a height of three hundred feet can discern a fish swimming at a depth of two or three feet or more beneath the surface of the sea, or as the wind-hover flying at a height of a hundred and fifty feet can see a field-mouse in the grass and herbage. The mousing hawk's vision is even more brilliant than this. In July and August he takes to feeding on grasshoppers, and from the same height as in mousing he can detect the insect, notwithstanding its smallness and assimilative colouring in the yellowing grass.

When the vulture has seen the thing he has been looking for, he drops down, aslant or in circles, out of the sky, and his action is seen by some other vulture or by more than one, a mile or two away, and they know what the action means and follow suit. And the action of these last is seen by still other vultures further away, and so on progressively until all the vultures engaged in quartering the earth over an area of a hundred square miles may be brought down to one spot in the space of thirty or forty minutes. Hence the strange phenomenon, the suddenly formed congregation of vultures where not one had been previously seen, dropping out of the void air as if by a miracle.

We now know from our airmen that scent particles do not rise far. One who has investigated the subject—J. M. Bacon—writes: "I can affirm that all the smoke of London is unnoticeable only a quarter of a mile in the sky, even in mid-winter when every chimney is doing its worst."

Marvellous as is the sight in birds as compared with that of other animals, it appears probable that in some genera the sense of smell has not decayed as in the majority. I have never been able to find out the truth about the old notion regarding the pigeon's love of fragrant smells. This belief has actually led to actions at law brought by a man against his neighbour for having robbed him of his pigeons by attracting them to a new dovecot by that means. It is a question which might be settled by experiment.

I am convinced that the true crows, represented in our country by the raven, carrion and hooded crows, the rook and daw, have a keen sense of smell. They too are carrion-eaters, but have not the long sight and soaring powers of the vulture; they fly low, and it may be that smell is a help to them in their quest for animal food. Where ravens are abundant, it is common knowledge among shepherds that the sight of a raven hovering over the flock is a sign that a sheep is sick and will probably die. The effluvium of the sick animal, which is not unlike that of a dead animal, has attracted the bird. A number of daws have been observed hovering over the water at one spot and returning day after day to repeat the action, although nothing to attract them appeared on the surface; but after several days it was discovered that the body of a drowned animal in a semi-decomposed state was lying at the bottom at that place. The smell from the water had attracted them. The very old and universal idea that the raven is a bird of ill omen and will hover over the house before the death of an inmate is, I believe, founded on a common habit of the bird. A sick man in the house will attract him as readily as a sick sheep in the fold out on the moor. And it is the same with the carrion crow.

I have the following remarkable case from a friend, a well-known literary man. He was down with typhoid fever, sick unto death, as the doctor and his people imagined, and when at the worst the house where he was lying was haunted for a whole day by a pair of carrion crows from a neighbouring pine-wood, where they were accustomed to breed. These crows had never shown themselves at or near the house before, but on that day they were constantly flying round and hovering over the house and alighting on the roof, uttering their raucous cries and apparently in a great state of excitement.

The people of the house were terribly upset about the way the birds went on: they are a people very free from anything like superstition, and yet for the life of them they could not quite shake the uncanny feeling off. My friend himself, when on recovering he was told of these happenings, thought it all very mysterious. Nor, when he consulted me about the matter, as one with some knowledge of bird psychology, did he find my explanation quite pleasing to him. He did not like to think that he had been like *that*, in the Lazarus state, not all of him dead but a good deal of him dead, and in such a condition as to excite the ravenous appetite of a crow.

The rook, too, is in some degree a supernatural or an uncanny bird, or a bird that appears to know more than a bird ought to know, and he sometimes behaves in a mysterious way. He is also a true crow in spite of his second nature—the desire to appear respectable which makes him shave his face and live the social life. My friend the late H. A. Paynter of Alnwick, a well-known Northumbrian and a good field naturalist, gave me a striking instance of the carrion crow coming out in the rook. My friend had a horse which died, and wishing to preserve the hide, he had the dead beast drawn up by ropes attached to the hind legs and hung on the branches of a big tree. In that position it was skinned and the carcass left hanging to be disposed of later; but the rooks, extremely abundant in the neighbourhood, were quickly attracted in numbers to it, and before the day was out they were in hundreds, circling like a black cloud round the tree and clinging like a swarm of bees to the carcass, all fighting with one another for a place, screaming with excitement and tearing at the flesh. He said it was a most extraordinary spectacle; it fascinated him; he watched it by the hour and would not allow the carcass to be taken down. The next day the birds returned in greater numbers and continued their sanguinary feast until nothing but the suspended skeleton remained.

This incident throws no light on the question of scent; I have related it just to show the rook as a crow, and as an introduction to another incident—one of the uncanny sort.

This case too is given at second hand, nor was it actually witnessed by my friend and informant himself; but I have every faith in him; he is a naturalist, a worker now in marine biology, and was staying at the time in Essex, close to where it happened; he had a full account of it from those who witnessed the scene, and was much impressed in his mind about it.

It happened at a manor-house in Essex with an old and populous rookery on a group of elm trees near the dwelling. The squire, an old man, was dying, and on the day of his death the birds all at once rose up with excited cawings and came streaming down to the house to hover in a dense crowd before the windows of the sick man's room, beating on the windows with their wings, and screaming as if they had gone mad. Naturally their action had a disturbing and even terrifying effect on the inmates, and its uncanny significance was increased when the birds rose up and rushed away as if in terror, and when it was found that they had abandoned the rookery; for they never came back to it.

Many a naturalist would no doubt say of this rook story that he had heard stories like that before, and decline to believe it; and his reason for disbelieving it would be the same as that of the scientist, or psychologist, for refusing to believe in telepathy—*because it is impossible*, or, in other words, because it is inexplicable, which means only that it has not yet been explained. It would not, however, be difficult to find an explanation of the rooks' action in this case when we consider the habits, the instincts, active and dormant, of the bird, and of his nearest corvine relations; for we have seen that the rook is a carrion crow in disguise, even as the crow itself is a lesser raven. I take it that, as in the case of the carrion crow hovering about my friend's house when he was lying at death's door, the effluvium from the sick-room excited them to that crazy pitch; also that it may have been the example of a single bird in the community, one that was more a carrion crow than his fellows, that first set them off; for we know that it is with birds and beasts as with men, that a crazy impulse of one in the crowd will sometimes make the whole crowd crazy.

Rooks, we know, do occasionally abandon suddenly even a very old rookery for no visible cause, often to the lasting regret of the owner, who has been accustomed to have the birds as neighbours from childhood. Rooks have even been known to forsake a rookery in this sudden way in the breeding season when there were incubated eggs and fledglings in the nests.

Much more might be written on this theme, but time and space are wanting, and the rest of this chapter must be given to the subject of panic fear in mammals, the class of animals in which it is most noticeable.

Those who have seen much of animals, wild and tame and semi-domestic, are familiar with the phenomenon, and it is common to hear a person say of an animal he had witnessed thrown into a state of extreme terror for no apparent reason, that it acted as if it had "seen a ghost." It is probable enough that animals *do* see ghosts, or phantasms, seeing that there are animal as well as human ghosts, also that there is telepathy between man and animals; nevertheless, I believe that in most cases where an animal has been seized by panic fear for no reason that we can see, the ghost is nothing but a smell which experience or tradition has made terrifying. It is an associate feeling of the individual and of the herd.

The most interesting instances I know of relate to the domestic animals, cattle and horses, on the plains or pampas of the Argentine, the greatest cattle and horse-breeding region on the globe, where as many as 50,000 head of cattle were sometimes grazed on one estate. No estates were enclosed in my time; it was all open country, and the animals were semi-feral in their habits, roaming at will over the plain, but watched by the cattlemen and driven back when going too far from their own lands. I know one estancia where as many as fifty dogs were kept to assist the horsemen in keeping their cattle within bounds. Even so, they were never wholly successful, especially in excessively dry seasons, when the wind would blow to them intelligence of water and better pasturage to dry districts where the grass was failing; and they would follow up the scent for twenty or thirty or forty miles from home. At such seasons, on the spots where there was water and better grass, the vast level plain swarming with an incredible multitude of animals presented an astonishing scene. It was all, in the gaucho language, cattle and sky, or literally cows and sky—*vacas y cielo*.

These cattle migrations gave the cattlemen a good deal of work, but did not entail serious losses; the losses were when there was a panic and stampede, a common phenomenon on the frontier, and in many instances it preceded and gave warning of an Indian invasion—the cattle smelt the coming enemy. The Indians of the pampas have a very strong smell; with a wind blowing from a camp one is conscious of it at a distance of a mile, more or less, and it is like the familiar homely smell of a rag-and-bone shop in a city slum. These savages do not wash nor *dust*; they anoint their whole bodies instead with the rancid fat of the horses used as food. With the wind blowing from the desert country, this stampede would begin a day or even longer before the enemy appeared on the scene, usually in peaceable times when no one dreamt of such things. The panic would extend along the frontier line for a distance of thirty to sixty miles, the horses taking the lead and flying in from the outermost estancias, followed by the cattle. These great stampedes affected hundreds of thousands of animals and carried them far from home, scattering them so widely over the country, where they mixed with other herds, that large numbers of them were permanently lost to their owners.

The frontier at that time was protected by a line of small mud-built forts, each garrisoned by two or three score of soldiers, or gauchos, armed with swords and carbines, the little forts being situated at a distance of from five to ten leagues apart. The Indians, when invading, divided their forces into a number of bands, which came in at a furious pace at several widely separated points. Moving rapidly, they would harry the outside estancias, killing and taking captives, burning houses, and gathering all the cattle and horses they could overtake, and with their spoils they would retreat to the desert, giving their enemy as wide a berth as possible, but fighting him when overtaken.

This was the state of things on all the Argentine frontiers in my time, and it had been so from the time the country was first colonised, and it continued so down to the eighties of last century, when at long last the war was carried into the desert and the tribes beaten and their raiding spirit broken for ever.

The reader will perhaps smile incredulously when I state that the Indians in this war of over two centuries did not use fire-arms and had no weapon but a lance made of bamboo cane, of an extraordinary length, which was not carried as the civilised soldier carries his lance, but was grasped in the hand a yard or so from the point and allowed to trail on the ground. And yet—will it be believed?—when it came to actual fighting with a body of civilised whites—soldiers armed with carbine and sword—these poor savages were victorious as often as not. How did they do it, seeing that the lance is the least effective of all weapons used in war except against an enemy already broken and in retreat? They succeeded in most cases owing to the terror they produced in the white men's horses. It must be understood that it was in all cases solely a fight on horseback. Infantry and artillery were useless owing to the extreme rapidity of the movements of the Indian bands, which had to be chased all over the invaded district. The Indians, always better mounted than the whites, stayed to fight only when it suited them, and their method was to come on, widely scattered, in furious rushes, lying flat on their horses' backs and necks and uttering their piercing battle-cry. But it was the Indian *smell* which gave them the advantage, as it produced so great a terror in the enemy's horses that it was impossible to control them and make them face the Indians; and with a horse maddened by terror under him no man could use his carbine. His only salvation was to allow his horse to go—to fly from the enemy with (it is needless to add) his rider on his back.

I will here, in conclusion of this chapter, relate an incident of this long-lasting frontier war which made a deep impression on us in my home on the pampas when I was a boy, for a reason to be stated by-and-by.

The Indians were invading the southern frontier of the province of Buenos Ayres, and troops in small bands were being hurriedly sent to that part. One of the officers sent from the capital, a colonel, on arriving at the frontier station and village of the Azul, was put in command of a contingent of two hundred men and ordered to proceed to a spot about sixty or sixty-five miles further south, and to take with him five hundred horses over the number required for his own men, to supply fresh mounts to other contingents which had already been sent to the same place. Before reaching his destination he came to an estancia which had been abandoned by its owners, where there was a large corral—a cattle enclosure made of upright posts eight or ten feet high, placed close together. Here he stayed for his troops to change horses and roast their meat, as it was about noon and the men were hungry. By-and-by the scouts he had sent out returned at full speed to report that a considerable body of Indians had been spied coming towards them. The colonel at once ordered his men to drive the horses into the corral, and having got them in, he next ordered the men to go in after them and to place themselves all round the line of posts and open fire upon the Indians as soon as they came within firing distance. In a very short time the Indians appeared, lying on their horses and uttering their usual yells, and the horses, maddened with terror, began to rush round, and, hurling themselves against the posts, knocked and trampled the men down until from their commanding officer himself to the last man not one was left standing upright. They were simply trampled and suffocated to death, while the Indians, yelling and *smelling*, but still keeping warily at a considerable distance, rushed furiously round and round, until, satisfied that they had nothing to fear, they came and opened the gate and let the horses out. Then, dismounting, they rushed in and began prodding the prostrate men with their lances, and stripping them of their ponchos and any valuables they possessed. But they were in a mighty hurry to get away with their booty, and of the two hundred men there was one survivor—one poor wretch who, lying with another man over him, had remained conscious all the time. Now when some of the Indians came to where he was lying they inflicted a spear-thrust in his body, but did not see that they had not finished killing him. Some time after they had left he succeeded in crawling out, and later that day another troop of soldiers in pursuit of the Indians came on the scene and rescued him. It was this man who gave a full account of what had happened; it was, however, but a small incident, one of ten thousand little frontier tragedies, and not of importance enough to find a place in any local history.

The reason that it profoundly impressed us in my boyhood's home was that the commanding officer who made the fatal mistake of placing his men inside instead of outside of the corral was known personally to us; and on his way to the frontier called to see us and spent two or three hours in conversation with my parents. Then some months later we saw and had a talk with the poor wretch who had come through the agony alive. But although under middle age, he probably did not keep long alive. His unnaturally white drawn face was painful to look at, and he suffered terribly as a result of the hammering blows of hoofs on his body and the wound from the Indian's lance.

I think that some reader of these memories will put the question: Why did not the military authorities of that country supply the men employed in safeguarding the frontiers from Indian attacks with horses drawn from another district—horses that had not imbibed the tradition of terror of the Indian smell?

The answer is: Because they didn't.

IX

The way this book is being written—The hind in Richmond Park again—An imaginary colloquy—Sense of direction in animals and man—Snakes—Insects—A foraging ant—Fishes, batrachians, birds and mammals—Smell in self-preservation—Horses: the history of a homing horse—Sense of direction in man—A gaucho's testimony—Sudden recovery of the sense of direction—Comments.

IN writing this book I am occasionally reminded of a mushroom-gathering experience on some warm misty September morning when my eyes were searching the ground about or before me while my mind was occupied with some other matter. Here, at this spot, I find no fewer than three perfect beauties—silvery-white hemispherical bosses in the green carpet, and, gathering them, I go on delighted at my success. Then, after going thirty yards or so, I all at once remember that on first sighting them I had distinctly counted four mushrooms and am compelled to retrace my steps to try and re-find the one I had left ungathered. So with the book: from time to time a something omitted comes back and obliges me to break off and go some distance back, if not to the starting-point.

I may be told that I am to blame in not having mapped out my route beforehand, and that the only thing to do now is to break up the work and build it afresh. It would not suit me to do that.

No doubt anyone who has got as far as the second chapter has formed the idea that this is to be a mere collection of incidents and impressions, with comments thereon, on a great variety of subjects—a book without a plan, a sort of *olla podrida*. It is not so. When I first observed the hind in Richmond Park my thought was about its senses, which led me to compare them with those of other animals, including man; and as I possessed a store of my own observations on the subject, supplemented with others from reading, I foresaw when I began to set them down that a book would result. It then occurred to me that in this work I would not follow the usual method by setting down the heads or leading themes in their proper order, then working them out. My own unmethodical method would be to let the observation and the thought carry me whithersoever it would.

We know from Butler, if not from our own feeble efforts at making poetry, that rhymes the rudders are of verses by which they often steer their courses; —a queer sort of rudder with a mind of its own to carry us into places which we had no intention of visiting! But it is quite true; and so with this rudder of mine which takes me where it will, and if it overshoots the mark and goes back I must go back with it. My plan then is an unplanned one, a picking up as I go along of a variety of questions concerning the senses, just as they rise spontaneously from what has gone before.

Having got thus far with my explanations I must now throw over the mushroom-gathering simile, seeing that the business I am occupied with is more of the nature of tree-climbing. The root thereof is the hind, her senses and behaviour, and from this root spring the trunk and branches I am climbing; and the trouble is that when I have finished exploring the branch I happen to be on and am about to proceed to the next one above it, I discover that I have left one beneath me unexplored and am obliged to return to it.

For example, this little frontier tragedy, related at the conclusion of the last chapter, reminds me of a serious omission. The simple word *frontier* has served to bring it back, recalling as it does the long months I have spent on divers occasions, in heat and cold, by day and night, on foot and on horseback, on that vast vacant territory bordering on the lands inhabited by men and cattle, or outside them, and of the value in such regions of a sense and instinct common to man and beast, which in civilised and populous districts is of no more importance than our decayed sense of smell.

Here then I come back to my interview with my lady stag, reposing with her back to me and adjusting her ears so as to listen to the incomprehensible sound I emitted, while attending to the other understandable ones that come to her from the wood.

If by an exercise of magic I could have projected the power of abstract thought into her cervine brains our colloquy would have been more interesting, and she would have told me how much I had lost by developing a bigger brain and assuming an erect position on my hind legs. Thus, my muscular sense and sense of equilibrium, with perfect co-ordination of all the nerves and faculties in me, were inferior to hers. Finally, assuming that she was the same hind I spoke about at the beginning of the book, she would have reminded me of her action on that occasion; how, when insulted by the offer of an acorn by a creature in a scarlet mantle, she had savagely resented and resolved at the same time to accept the gift and punish the giver; and how she snatched the spray from the outstretched hand, then, on the instant of doing so, took a flying leap over the child's head, and at the moment of her forefeet touching the ground lashed out behind with so good an aim that she grazed the face, and, given an inch more, would have slashed it open with her sharp knife-like hind hoofs.

A great quarrel, with many keen thrusts on both sides, also with some laughter, and all the time the feeling in me, bitter as death, that she had the best of the argument; that it would have been better that animal life had continued till the time of the dying of all life on the earth with no such development as that of the large-brained being who walks erect and smiling looks on heaven.

But I had no magic: all I could do was to tease and mystify her by whistling, and she could do no more than give me a small share of her listening attention. Finally, unable to make any sense out of the sounds I emitted, she got up as I have told, shook herself to get rid of dust and dead leaves on her coat, then walked straight away without a glance at the person sitting behind her. If she had been a great lady in a drawing-room, who had taken offence at some injudicious or impertinent remark I had dropped in conversation with her, and had got up and walked away without a word or look—ruling my existence out—she could not have done it better. She walked straight away to some other place in the park where she wished to be. To that spot she would go in a bee-line, not thinking about the right direction or indeed about anything, but with a mind agreeably occupied with the sights and sounds and scents that came to her.

Then came my turn to go as it was now late in the day, and after some moments' hesitation as to which gate would suit me best for an exit on that afternoon—Richmond, Kingston or Sheen—I too got up and walked off, occupied with my own thoughts and also, like the hind, amusing myself with the sights and sounds and scents, leaving the whole business of getting to my destination to my legs and the compass in my brain.

Here, too, as in the sense of equilibrium, she had an immense advantage over me—incalculably great, if night and thick darkness had surprised us still together at that spot. Not in Richmond Park only, but on Exmoor or in any vast deer-forest in the North, she would go by night or day unhesitatingly in a direct line to her destination. But no sooner am I in a place I don't know and lose sight of the sun, or have been making many turns in a wood, than I lose the sense of direction. Thus, if I go to

Piccadilly Circus by tube and, leaving my train, wander about in the galleries in search of the right station for some other part of London, I cease to know the points of the compass. But for the lettering on the walls and the arrow-heads and pointing fingers I am as effectually lost as if I had fallen into a deep hole and had, at the end of it, crawled out at the Antipodes.

Judging from myself (a very bad case I dare say), the sense of direction is a dwindling one in our civilised state, and in many of us appears to be wholly gone. Yet to man living in a state of nature it is of vital importance, as it is to all animals endowed with locomotive organs—wings, fins, legs and, in the ophidians, ribs and scales. The snake does not, as Tautus taught us, move by means of its fiery spirit. And we know that snakes, with practically no horizon at all and so short-sighted that they can have no landmarks, do yet possess the sense of direction in a remarkable degree. Thus, there are authentic cases on record of tame snakes travelling long distances back to the home from which they had been removed—incidents similar to those we are accustomed to hear every day with regard to our domestic animals and pets. Apart from such cases, we see from observation of their habits that the snake could not do very well without such a sense. Thus, take the snakes that inhabit great grass countries like the prairies, or, better still, the absolutely flat pampas, where the snake, moving on its belly, is down in the grass and seldom has its head above it. In that temperate climate they do not æstivate, but spend the eight or nine warm months distributed over the land. The snake may go a long distance in search of the female; going to her, he has the wind and the message it conveys to him for guide, but there is no extraneous force, no "nimble emanations" to lead him back to his accustomed haunts—the home where he passes his long summers and his whole life. At the approach of winter, in May, he returns to his hybernaculum, which he shares with many others of his kind, coming in from all directions and various distances. The wintering site is as a rule in a mound on the plain formed by rodents, armadillos and other excavating mammals, and in one of the old cavities they mass themselves together to drowse away the two or three cold months. It is plain that without a sense of direction the serpent, crawling on his belly through the grass over a flat featureless ground, could not find his way back to the same spot each year.

As to insects, a little observation of wasps, bees, ants and others, both social and solitary, that cannot carry on the business of life without constantly returning to one point, is enough to show that they could not exist without such a sense. It is perhaps most easily seen in the ants. Take your seat on the turf on a chalk down and look at the ground, and you will see a minute black ant hurrying about on his business. You don't know how long he has been abroad, but the chances are you will get tired of watching him before he returns to his home. For a home he has, a minute hole somewhere under the grass leading into his subterranean galleries, where he spends part of his time; and as his sense-organs are specialised in two directions, he will then move about as freely in the dark, and know just what to do and how to do it, as well as out in the brilliant sunlight. Night and day, and above ground and underground, are all one to him. If, when watching him, you try the experiment of putting a finger close to him he is overwhelmed with astonishment; at first struck motionless, and then, recovering his faculties, he rushes wildly away. The near approach of your finger to him was like a tremendous tornado charged with every violent animal smell in the world bursting suddenly upon a horse, let us say. But soon he recovers from his panic and goes on with his everlasting quest, and you are obliged to go after him on your hands and knees to keep him in sight. He is probably now leagues away from his home, still hurriedly pushing his way through the endless forest. For to him the grasses are like trees and their stems like trunks, and they stand up and lean and lie about in all positions. He goes round this one, crawls under the next, and climbs over a third, and cannot see a distance of half an inch before him. Tired of watching him you get up and go away, and he goes on and on and will continue to go on until he finds what he is looking for, and then will set out on his return, working his way through that interminable forest, that boundless contiguity of shading grasses, straight to his home.

And as with serpents and insects, and fishes and batrachians, so it is with birds and mammals, all which when out and away from home on their various quests are, as the poet says of the migrating bird, "lone wanderers, but not lost." There is not a village or hamlet in the kingdom, nor, I imagine, anywhere in the world, where you will not be told strange yet familiar stories of a domestic or pet animal returning from long distances to its old home over ground unknown to it where it could never have memorised the landmarks. Such instances are so common that anyone who thought it worth his while could collect a volume full of them in a few weeks. Even here, in this house in Penzance where I am writing this chapter, two such cases have been related to me of cats; one that was sent away to a distant village in a closed basket and promptly returned to its home here; the other of a cat received here from St. Just, seven miles away over a rough moor, who disappeared on the evening of its arrival and reappeared the very next day at St. Just. Also I have just received from a correspondent in America an extraordinary case of a dog sent by rail and water across the country to a southern State, who soon vanished from his new home to reappear several months later at his old home, 800 miles distant. This is an authentic case, and the astonishing thing is that in that immense journey the desire for home, the nostalgia, the impelling force, was not overcome by the difficulties—by hunger and fatigue and the hostility and persecutions met with from man and dogs encountered on the way.

The overpowering desire for home had carried him through all this misery, and he arrived at last looking like a very old worn-out dog.

As we higher animals are also subject to nostalgia, we can sympathise with the cat and dog in their sufferings in a strange place—the sense of disharmony. Especially so if we consider that smell, which is nothing to us, is to them more than sight; more even than vision and hearing together. They live in smells. In the familiar smells of their home, their surroundings, in and out of doors, they are in their element, at peace. Instinctively the animal regards every strange smell with suspicion: it is a warning of danger perhaps, and for all his domestication and tameness he cannot be free of this inheritance. We can imagine then what it must be to remove an animal of this kind, a cat let us say, from his familiar home into a world of unknown smells!

In my early home on the Argentine pampas we thought less about cats and dogs in this connection than horses; for it was in a region where, as the gauchos say, the horse is the legs that carry you. It was a common thing to hear a gaucho say, when his horses, or some of them, had been stolen, that he counted on the recovery of such a one, seeing that however far they took him from his home and district, however long they kept him hobbled or collared to another horse, he would, on the first opportunity that offered, make his escape and find his way back.

Here I will insert the history of a horse I was intimate with for a space of over ten years. He was an iron grey, the colour called *moro* by the natives, and as he was the only one of that colour in our troop we named him Moro. He came to us from some gaucho friends who lived at their estancia about forty miles south of our home; and as we were warned that Moro was a home-loving horse, it was necessary to keep him collared to one of the horses of the establishment for a month before letting him go free. I retain a vivid recollection of this animal, so that he stands out from the hundreds of horses I have ridden among the half a dozen or so that have most impressed me with their personality. He had a spirit and dash above all the horses I have known and ridden: to be touched with whip or spur would drive him wild. One had to keep a tight rein on him, as with a man on his back his one desire was to let himself go at his topmost speed. But he had a silken mouth and the most perfect control over his motions. He was the only horse I ever possessed that when at full speed could be brought to a sudden stand, and then, with a touch on his neck, be made to spin round as on a pivot. His instant response when you set him to do these things seemed to show that he loved doing them. His chief fault was that he was intolerant of strangers, and if carelessly approached by one he did not know he would lash out with his heels, so that our visitors always had to be warned not to go near the dangerous animal.

One day on coming home on Moro I rode into the *patio* or yard, and leaving him standing there went into the house, and just then a child of some people on a visit to us, a little boy of seven from town and perfectly ignorant of country things, ran out, and seeing Moro standing there with his long tail almost touching the ground, he went to it and, twisting his little hands into the hair, began swinging himself to and fro. The moment I caught sight of him I thought it was all over with the child, for Moro was in a passion, tossing his head and stamping on the ground—in another moment the child's brains would be dashed out! I yelled at him, and loosing his hold he came to me unhurt. Everyone said it was a miracle—it was Providence that saved the child's life. It was, I think, the animal's intelligence, his knowledge that it was an innocent child and not a grown-up that was taking this liberty with him, which restrained his impulse to strike.

The one thing about Moro which comes properly into the subject I am writing about was his home instinct. Although he became reconciled to his new surroundings and attached to the horses he lived and grazed with, whenever we had a long spell of cold windy and rainy weather in winter—always a time of intense discomfort to horses living on the flat open unsheltered plain where not a tree was growing—Moro would disappear. Then, as a rule, after a week or two there would be a message from our distant gaucho friends to inform me that Moro had turned up at their place, and that he would be sent as soon as anyone of the estancia had occasion to travel our way. On his return it was not necessary to collar him to another horse: he was always pleased to be back with his familiar friends and companions, and would settle down and live quite contentedly until, when another bad spell in the weather occurred after six or twelve months, he would disappear again, and this state of things continued as long as he lived.

The explanation of Moro's action is, I fancy, simple enough. He was reconciled to his second home and attached to the animals he consorted with, and had no desire to return to his former home in ordinary circumstances. But in the intense discomfort induced by a seemingly endless spell of bad weather, when he was being lashed with cold rain perpetually day and night, he was reminded of his home; he had an image of the wide green plains bathed in everlasting genial sunshine: the image, the vision, produced the illusion that even thus would he see it again if he returned to it, and in the end he fled back a distance of forty miles to escape from his misery.

We know that animals are capable of visualising past scenes in this way. I have given instances of this faculty and the delusions it gives rise to, in writing of the horse and guanaco in my *Naturalist in La Plata.*

It remains to speak of the sense of direction in man. He is dependent on the same senses and faculties as any other rapacious mammal in his quest for food. No doubt the higher we go in the organic scale the less dependent the animal is on instinct pure and simple: in other words, the more does intelligence enter into the instinctive act. Thus, we will find an instinct common to mammals and birds less intelligent and more perfect in the latter. In birds, we may say, the sense of direction is more nearly infallible than in mammals. Thus, you will see a basketful of homing pigeons released at the Marble Arch, the birds all flying off in various directions to their homes in different parts of the country, from twenty or thirty to a couple of a hundred miles distant; and the chances are that not one out of twenty-five or thirty will fail to turn up at its destination. As the pigeon has existed in a domestic state for thousands of generations, it may be assumed that its homing faculty is not as perfect as in the wild bird. The bird has this faculty in greater perfection than the mammal because he needs it owing to his wings, which give him an immensely wider range and swifter motion. The mammal, moving on the ground, has more need of intelligence in every act of its life, in every step it takes, and no doubt memorises more. Yet I would say that the mammal, including man in a state of nature, is no more able to do without that sense than the small ant, that "lone wanderer, but not lost," on the grassy down.

I would say, then, that as mentality enters more into the actions of man, even in his most primitive state, than in other mammals, the sense of direction is less perfect in him than in them. Also that in highly civilised man, especially in urban districts, the sense is so weak as almost to be regarded as obsolescent. Like the sense of smell it is not needed, and in that condition its decay is inevitable. Nevertheless, when the need comes it revives, and when one is among savages or semi-civilised men much given to roaming, one meets with instances of the sense as acute and efficient as in the lower animals

I heard a good deal said on this subject early in life; as a boy it interested me because when I took to long solitary rambles, on foot or horseback, I made the discovery that I had a rather poor sense of direction, and when I got lost, which happened from time to time in a fog or at night and even in broad daylight when I was out of sight of all known landmarks, it had an extremely distressing effect on me and appeared to be a danger. Later, when I had grown up, I had some discussion on the subject with a young gaucho friend. One day in company he told us of a day spent in a search after lost horses at a long distance from the ranch where he had his temporary home. He had a companion with him, and when they were from nine to ten leagues from home night came very suddenly on them, with a black cloud covering the whole sky and rain in torrents. His companion cried out that there was nothing to do but dismount and spend the night sitting on their saddles and trying to keep themselves dry by wrapping their skin horse-rugs and ponchos round them. My friend laughed at such a proposal and said that they would go back and would be at home in about four hours or so, and would then be able to dry their clothes and get something to eat. The other was incredulous; it was all a flat plain with no road and not a star to show them the way. Nevertheless, they set out and arrived before midnight at the hovel which was their destination, and only when they dismounted and pushed the door open could he convince his companion that no road or light of star was needed to find your way back; nothing, in fact, was wanting but one's own sense.

It was just that sense, I told him, that I was without, and I knew that many others were in the same condition, otherwise we would not hear of people getting lost. That he possessed this sense in such perfection seemed almost incredible.

He replied that to him it seemed incredible that any sane person complete in his senses should be without it. He had to believe there were such men, just as there were others blind or deaf or idiots from birth. It made him laugh. For how could anyone, no matter how far he might go in a strange district, or how many turns he might take, fail to know just where he was and the exact direction of the place he wished to return to? You could take him blindfolded fifty leagues off into any place unknown to him, and lead him now in this direction, now in that, then take off the bandage in a dark night and set him free, and he would not be lost. Naturally he would know the right direction to take. How could he help knowing it?

I was surprised at hearing all this, as up till then I had looked on this young gaucho friend who did not know a letter of the alphabet as a good-natured half-fool. He was a big fellow, so dark, with such thick lips and such broad nostrils, that one supposed he had negro blood in him, and, negro-like, he was much given to laughter. But he had coarse lank black hair which was not negro-like. As he had been so much on horseback he waddled on the ground, and was like a big clumsy animal walking with difficulty on his hind legs. Then there were his garments: a waistcoat or blouse as a rule, new and of some crude, glaring colour, yellow or scarlet or blue, and all the others old and frayed and the colour of clay. As a rule he was without boots, being a poor devil, with his big iron spurs buckled on his bare feet. But now I conceived a great respect for him, and envied him the possession of something which I lacked and greatly missed.

This is perhaps an extreme case; nevertheless, men of that kind, who were never lost and never at a loss, were not uncommon on our Argentine frontiers. A man of that kind who had a bold and adventurous spirit as well was called a *Rastreador*, and was employed to go out into the desert and spy on the Indians.

It is probable that even in our ultra-civilised state there are individuals among us who possess the sense in a high degree although they may not know it themselves, just as there are those who have a sense of smell acute as that of any pure savage. This would not be strange: more wonderful is the fact that on some rare occasion the faculty should revive and burn in its pristine power in an individual in whom it had appeared to be non-existent. Here is a case in point.

Years ago, when following a discussion on a sense of direction in man in one of the weekly journals, I read of an instance of this reversion of the brain to a past state—a recovery of a lost sense. It occurred to a man, a dweller in a town, who went with a friend for an autumn holiday in a forest district in North America. They camped on the borders of a forest at a distance from any settlement, and the narrator, taking his gun, went off alone into the woods to look for something to shoot. He spent long hours in the forest, and at last when he was deep in it, surrounded on all sides by trees, and remembered that he had taken many turns, it suddenly came on him with a shock that he was lost, miles distant probably from his starting-point, and had not the faintest idea in which direction it was. He was terribly distressed, for the day was drawing to a close and he feared that to whichsoever side he directed his steps it would perhaps only take him further away. He fired several shots in the hope that some hunter or someone looking for him would hear them and come to his rescue. But no one came, and no answering shot or shout broke the silence. Then, when his distress was greatest, when he was in despair, all at once a light came to him, a sudden sense of relief, a feeling and a conviction that he knew exactly which direction to take. So convinced was he, that he set out not only confidently but gladly. And his instinct proved right: he came out of the wood and found the camp before him.

This narrative interested me deeply, simply because it so closely resembled an experience I once had—the one and only time when I have known the full meaning of such a sense—its certitude and its value to the lower animals and to man living in a state of nature, as he has existed for (let us say) a million years. My case was this. I was in a forest, and in the middle of a thick wood covering an area of several miles, with dense thickets and bogs and streams on its borders. I had been in it for several hours watching some woodland birds I was interested in, and, absorbed in my occupation, night surprised me and a sudden darkness caused by a cloud overspreading the sky; I realised that I was lost, since I did not know in which part of the wood I was, or which direction to take, and could not see on which side the sun had gone down. I feared, too, that if I tried to get out I should most probably get among the bogs and streams and dense thickets. And it was getting cold, as I was in the thinnest summer clothes and had been perspiring profusely. And suddenly, while standing there peering into the thick blackness all round me and feeling keenly distressed, relief came, and it was as if I had been captive and was unexpectedly set free. I did not know where I was and where the feared bogs were, but I knew in which direction to go. There was no hesitation, no shadow of a doubt. Off I went rejoicing where my supernatural faculty, as it then almost seemed to be, commanded, and after walking for half an hour came upon a blacker blackness where the undergrowth was so dense that it was extremely difficult to force my way through it. Again and again I came to places like that, yet dared not attempt to get round these thickets, fearing that if I varied the least bit from the bee-line I was making I might lose the sense of direction that guided me. I must, I felt, keep the line. Eventually I got free of the wood, and coming into an open space I dimly discerned a dwarf tree with a stout malformed trunk which I recognised as one of my landmarks on the borders of the wood, and there saw that I was actually making a bee-line for my destination. *Now* I knew where I was, and remembered that another smaller wood lay before me; then a mile or so of open grass-land to the lonely farmhouse I was making for.

The feeling I had experienced on that one occasion, from the moment it came to me in the depths of that dark wood that I knew my way, was one of intense elation: it affected me like the recovery of something infinitely precious, so long lost that I had been without hope of ever finding it again; and it was like the recovery of sight to a blind man; or like that "vision of Paradise" which a temporary recovery of the sense of smell had seemed to Wordsworth as he sat in a garden full of flowers; or like the recovery of memory in one who had lost that faculty. And this elation lasted until I recognised the landmark, the deformed tree, and began to memorise the wood that yet remained to be got through and the open ground beyond it. Memory and thinking took the place of something which had been like an inspiration, an intuition, and had a sobering effect. I had to rely on my memory and reasoning faculties now.

It was a strange experience—perhaps the strangest

I have ever had, when I remember the many occasions on which I have lost myself and have had long anxious hours of wandering in some unfamiliar place with no faintest intimation of any such helpful sense in me. For if this sense is so feeble in or so lost to us, how came it to revive and function so perfectly on this one occasion? The psychologist cannot help me, seeing that he takes no account of such a faculty; nor the physiologist, since there is no corresponding organ known to his science. But there is, there must be, an organ, albeit unrecognisable, a specialised nerve in the brain, I suppose, which keeps a record of all our turns and windings about, and ever, like the magnetic needle, swings faithfully round to point infallibly in the direction to which we desire in the end to return. This, at all events, is how it must be in the lower animal, and in savage men. Admitting so much, how came it to revive and function so perfectly in an individual who had appeared to be without it? I can only suppose that it is not actually obsolete in us, that it still exists and continues to function feebly —so feebly, indeed, that we rarely or never become conscious of it. If this be so, I take it that on this one occasion the nerve was highly excited by my mental agitation, the sense of being lost in that dark wood, and that in that state it recovered its function and the record of all the changes of direction I had taken in my roamings about, and eventually produced that conscious feeling of confidence and elation.

X

Migration unrelated to a sense of direction—Personal observations—The old simple account of the phenomenon—Migration a mystery still—Newton and Addison: the supernatural theory—Dr. Henry More—Erasmus Darwin and his tradition theory—Wallace and others—Canon Tristram's theory of the origin of life in the Arctic regions—Glacial epochs and Seebohm in search of evidence—Benjamin Kidd and the simple sun theory—Aspects of migration in England—We are still left wondering—Recent futile methods of attacking the problem—A new method suggested.

IT is inevitable in considering the subject of a sense of direction that one should think often of migration—of the seasonal migration of birds, let us say. Inevitable, because, viewed superficially, these two senses (for that is what they are) appear as one. There is at all events a close resemblance in their action, just as there is in other instinctive acts which are distinct—fight and play, for example. Probably nine persons in every ten who had never given a thought to the question, if interrogated, would say at once that they were essentially one. And the nine men in the street in any ten would have Romanes to support them.

It is not so. They are distinct in their origin and functions: they are senses, with nerves in the brain for organs — nerves that respond to distinctly different stimuli. We can only describe such a sense as that of direction by metaphor or illustration, likening it to something else. Or we might, *à la* Frankenstein, construct a mechanical monster full of an infinite number of wheels and springs and numbered buttons—one, two, three, etc.—to be touched in order at each and every turn the monster may take in his peregrinations. A less clumsy contrivance might be made to illustrate migration—a flying machine with the necessary clockwork in its bowels, wound up to fly north and south a given distance—five hundred to nine or ten thousand miles, let us say—then to drop quietly down on a suitable predestined landing-place.

The sense of direction is like the unconscious sense of smell, or rather of the *specialised* olfactory nerves, which to my thinking convey knowledge from outside without our knowing it. It is an unconscious power or faculty in us—in that particular nerve of the brain. Yet although it functions independently, like our breathing, we are conscious that we possess it—and by *we* I mean man in a state of nature—that we can rely on it as we can on our legs to carry us whithersoever we desire to go, and that finally it will guide us safely to our destination.

But in migration—to project ourselves, let us say, into the bird mind—there is no reliance on anything in us, no conscious guiding principle: it is simply a rushing away from we know not what into the unknown. A passion, a panic, like that which sometimes falls on a herd of wild horses and sends them rushing away from some real or imaginary danger.

Migration does not present itself in this aspect to the casual observer. The migrant has not told him what it feels, and he is perhaps accustomed to witness the birds congregating previous to departure; and although he can't quite believe that they call a council, state the certain day, form the phalanx, and so on and so forth, it does yet seem to him that the whole business is managed in a rather well-considered way—that there is, in fact, knowledge and a plan.

The answer to this anticipated objection will be given later on. My words were not wild and extravagant; they express a considered belief, founded not on other men's observations and writings, but solely on personal observation. My ideas were formed long before I ever saw a book on the subject or knew that any such book had been written. The elementary and general works on natural history which I read as a boy and youth contained only the usual statements, that birds migrated chiefly to escape the rigours of winter in a warmer climate; that when winter was past they returned to their natal home; and that the increasing scarcity of food was another cause of, and reason for, their departure.

This was too simple; even as a boy (in southern South America) I saw that the autumnal departure of birds began and continued throughout the most perfect season of the year—in nearly all species from mid-February to the end of May. The most perfect season, that is to say, for the birds, when the passionate wooing and fighting spring-season was long past and forgotten; when the labour and anxieties of reproduction were over, and the young safely reared and able to fend for themselves; when clouds and showers had mitigated the excessive heats and dryness of midsummer, and the weather was most genial and all bird food—fruit, seed and insects—most abundant; and finally when they had come into the serenest and sweetest time of their lives, with nothing to do but rejoice in the sunshine, feast and grow fatter and tamer every day, and, one would imagine, when they would be least inclined to set out on a weary and perilous journey of hundreds and thousands of miles.

It is not only in southern South America that birds quit their homes just when the life conditions are most favourable; it is the rule in all temperate regions, although it may not seem so in these brumous northern islands.

However, the easy explanation that birds went away because they would do better elsewhere, although it is still put forward in Newton's *Dictionary of Birds* and the *Encyclopædia Britannica*, was never regarded as a quite sufficient cause. How did the bird *know*—the young bird, let us say, that migrates alone—that he would do better elsewhere? After all, then, migration was a mystery; so much a mystery that the greatest man of science this country has produced, who discovered the laws that govern the motions of the heavenly bodies, said of the migration of birds that it was directly inspired by the Creator, since no other explanation was possible.

If I remember rightly something I read as a boy, this notion was adopted by Addison and beautifully commented on in one of his *Spectators*.

How odd it seems that just this one of the innumerable problems in the organic world that ask for solution should have been singled out for preferential treatment! I think the once famous Dr. Henry More of that age was more logical when he defined the "Spirit of Nature" as "a substance incorporeal, but without sense and animadversion, pervading the whole matter of the universe, and exercising a plastical power therein, according to the sundry predispositions and occasions in the parts it works upon, raising such phenomena in the world, by directing the parts of matter and their motions, as cannot be resolved into mere mechanical powers, which goes through and assists all corporeal beings, and in the vicarious person of God upon the universal matter of the world. This suggests to the spider the fancy of spinning or weaving her web, and to the bee of her forming of her honeycomb, and especially to the silkworm of conglomerating her both funeral and natal clue, and to the birds of building their nests and of their so diligently hatching their eggs."

He did not mention migration, probably because he always wrote in a hurry; he could not otherwise have produced a whole cart-load of books. But I have not quoted this passage just for fun, as a sample of his queer, rock-me-to-sleep, free-verse prose, nor as an example of the seventeenth-century mind, with its metaphysical bias, its religiosity and fantasticalness, when it speculated on the problems of biology.

I quote it only because it accords with a bent or tendency of many modern minds that are in revolt against the mechanicians, who will allow no soul to man nor spirit or purpose or ruler or maker to the world. We have seen how this temper is the cause of a perpetual harking back to the things of the past, to the time when man thought as a child, finding or trying to find some comfort in them—some justification of their mental attitude. If some of our physicists are coming to think that an electron may be spirit as well as substance, it may be profitable as well as soothing to return to Dr. Henry More.

Erasmus Darwin was born well in the Age of Reason, when miracles had ceased, and he accordingly sought for a natural explanation of this phenomenon and attributed it to tradition. Now it is true that most of the acts of social and gregarious animals are due to tradition, but unfortunately for this theory we know that very many of the migrants are solitary and that their young travel alone to their destinations. Finally this notion throws no light on the origin of the instinct. Nevertheless, it has persisted in a modified form or in various forms, and may be considered the parent of the idea of traditional, racial, and unconscious memory as the cause of migration. Romanes adopted this view, and also stated that migration was founded on a sense of direction. Alfred Russel Wallace also held it, but not satisfied that the explanation was a sufficient one, he gathered up the old simplicities and put them in. He says:

> The actual causes that determine the actual time, year by year, at which certain species migrate will of course be difficult to ascertain. I will say, however, that they will be found to depend on those climatic changes which most affect the particular species. The changes of colour or the fall of certain leaves, the change to the pupa state of certain insects, the prevalent winds or rains, or even the decreased temperature of the earth or water, may all have their influence. (*Nature*, 1874.)

Next comes Canon H. B. Tristram, a diligent student of birds and bird problems during his long life of eighty-six years, who late in the last century advanced his theory that all animal life originated in the Arctic regions; that when that portion of the globe grew too cold for comfort the birds were driven south. And that was the genesis of the instinct of migration. Then we have the addition of the glacial epoch notion advanced by others; how, when it passed away, the birds, remembering their ancient natal home, returned to or as far towards it as the conditions would allow to breed; then, when the short Arctic summer ended, they had to fly south again. Seebohm, the ornithologist, took up this notion with enthusiasm, and having extended it by inventing a succession of glacial epochs, went to Africa, where many wonderful things are found, to look for evidence. It was said that as he had sailed with four glacial epochs and returned with only three he must have accidentally dropped one overboard on his voyage home.

But although laughed at by some, others think there is something in this theory, and some even believe that it holds the field.

Nevertheless it is incredible when we consider that the inherited memory of the birds in their southern home must have continued as a living force or faculty, always ready to display itself in action, for thousands, or tens of thousands, of generations before a change in the climatic conditions made it possible for them to return.

Perhaps this list of guesses would not be complete without a mention of what may be called the sun theory, pure and simple. It has never to my knowledge been distinctly stated excepting by Benjamin Kidd in his last and posthumous work, *A Philosopher with Nature.* He regarded it as original, but the idea is, of course, implicit in all theories of migration. They are built on it. He says:

> It is one of the facts in the migration of birds over which naturalists have always found a difficulty, that the migrants both in the eastern and western hemispheres should in their journey to the south often begin to leave their haunts before the food supply in any way fails them, and before they have any physical want known to us indicating a coming change in the conditions of life. But students of the subject have probably not fully reckoned with the deep emotional effect on all wild nature of the waning light in the declining year, and on the uncontrollable instinct to follow the sinking sun begotten in those whose habits of life it affects.

It is, we see, beautifully simple: the sun is the source of light and heat, which means life; when cold and darkness threaten death as a consequence of its withdrawal, what more natural than that all creatures capable of swift and easy motion should follow it so as to keep alive by keeping near it! At the very outset we are confronted with the upsetting fact of many species that go further north to breed—in latitude of 80° to 85°—and fly south when the Arctic summer is over, but do not come to a stop when they have entered into warm regions, but fly on and on and across the zone of greatest heat and still on until they have left the Equator 30° to 40° or 45° behind, and would probably go further towards the Antarctic if the conditions permitted.

I think it was Aristotle who once remarked that it is always best to get the facts and then consider the causes. Doubtless he meant *all* the facts.

To conclude the survey, I will quote from a letter written to me on these questions by my friend Morley Roberts, whose recent work on *Warfare in the Human Body* entitles him to a respectful hearing.

He begins hopefully: "The problem of bird migration, though one of the most difficult in zoological investigation, does not seem to me wholly incapable of solution." His notion is what I have called the sun-theory, and he has been led to it by a study of the movements or reactions of the minute marine plant-animal, *Convoluta roscoffensis.* The north and south movements of birds "suggests a theory of negative and positive tropisms, a theory of behaviour, enforced by light and heat, which has become part of the avian nervous and muscular mechanism. This would mean the acquisition of a north and south 'sense' (or set of reactions), which would save those who went towards or from the sun." He then touches on the glacial epochs and inherited memory, and concludes with the following suggestions:

> If we conclude that we are dealing with more or less explicable tropisms, the most diligent and skilful observer among naturalists would acknowledge that those learned in biology, physiology and physiography might be of service in solving the problem. He might even go further and, considering that the earliest mass movements of birds must have originated soon after they were differentiated from reptiles and acquired powers of flight, would acknowledge that the geologist, palæontologist and astronomer, all of whom are conversant with earth variations over great periods of time, could be of assistance. Furthermore, as tropistic movements must in the end be considered as questions of energetics, it would not be absurd to ask a physicist to sit at the round table of inquiry.

These may be valuable suggestions, and I will only add that, as those who sit at round tables are not as a rule all equally open-minded or tolerant of other persons' opinions, it would be well to remove any chunks of old red sandstone which may be lying about in the conference chamber before the members meet.

The fact is, all these theories are equally satisfactory so long as the difficulties, all the facts, are not taken into account.

When I consider migration as it appears to me in this northern island, I think that if I had been born and bred here, seeing it in no other aspect, the problem would have appeared to me, as to so many others, an insoluble one. Year by year I have watched it so far as I was able. In March, April and May, one becomes aware of the arrival of the migrants, the summer visitors; they are here all about us after many months' absence, but we did not see them arrive. Only from some rocky headland in the south-western extremity of the country we may see a few pelagic species returning from the Atlantic and the Mediterranean seas to their ancient breeding haunts on our coast. Gannets sweeping by in wide curves, bird following bird, an endless procession; guillemots, razor-bills and puffins in black and white strings flying close to the surface, and shearwaters dashing by with wild, erratic flight.

But it is chiefly in the autumn that I watch the migrants; the swallows congregating, often many days before departure, flying south in flocks and settling down in a reed-bed or thick wood at sunset to roost. Then for days and weeks flying up and down the south coast from Kent to Cornwall, as if searching for a suitable crossing-place.

Again, one notes that from the end of August onwards passerine birds are mysteriously decreasing in numbers, and that species after species disappear entirely. We see them concentrating in immense numbers on the south coast. Wheat-ears are abundant on the South Downs, coming in from all over the land; while on the downs and the maritime district between the downs and the sea, you find flocks of wagtails of all species; meadow pipits in small companies; stonechats in half-dozens; linnets in hundreds and thousands, and many other species, all resting from their journey or deterred by the sight of the cold grey water before them. By-and-by they vanish, having taken their departure on some early morning.

But they do not all go; a great many individuals of the species that cross the Channel and travel on to the Mediterranean, and even to Africa, remain to winter in southern England.

Again, in October and November I have watched the winter visitants coming in from the North Sea, as a rule early in the morning in serene weather. Hooded crows travelling laboriously as if tired, bird following bird, or in small companies and at short distances apart; and at intervals redwings and fieldfares, flock succeeding flock, tired travellers too, all keeping to the same line or route.

This then is what we see of migration in England, which leaves us still wondering what the impulse may be in its origin and nature, the compelling force which takes the bird—plucks it, we may say, out of its familiar haunt, its home and place in which it knows just where to find its food, to seek a shelter from wind and storm, its sure refuge from sudden danger and its safe roosting-place at night. Outside of this familiar place all is a strange and hostile region. Only those who have made a close study of the habits of wild birds know how strong this attachment to locality is, especially in the small birds, the species that spend six months of each year scattered all over the continent of Africa, to reappear with us in April, every bird in its old haunt, the homestead, the copse, the hedge, the field or common it lived in, to sing and build again in the same tree, the same bush, as in former years. We wonder and still ask with the poet:

> What is this breath, ye sages say,
> That in a powerful language, felt not heard,
> Instructs the fowl of heaven?

And answer there is none, seeing that after due consideration of all the answers so far received we conclude that it would have been just as well if they had not been given.

Seeing then that so far no progress has been made, and that the new methods devised in recent years of tackling the problem by keeping records at lighthouses and other points of observation of the migratory movements—the species engaged, the dates of their appearance and of the great rushes, the state of the barometer, and so on; also the capturing and marking individual migrants all over the country—have all proved futile, I would suggest that another method be tried. This is to observe the birds more closely, not only here and in Europe generally, but in Asia and Australasia, Africa and America, and wherever birds migrate; to observe their behaviour, not only on migration, but previous to departure, for I do believe that this would be a more hopeful way; and my best way of explaining my meaning would, I imagine, be to give an account of my early observations in the country of my birth—the Argentine plains or pampas south of Buenos Ayres, and in Patagonia.

XI

Aspects of migration in southern South America — Migrants from the northern hemisphere—The abundance of bird life —Golden plover—Eskimo curlew—Buff-breasted sandpiper —Glossy ibis—Cow-bird—Military starling—Upland plover —The beautiful has vanished and returns not.

IT would not be possible for me to convey to readers whose mental image of the visible world and its feathered inhabitants was formed here in England the impression made on my mind, in my early years in the land of my birth, of the spectacle of bird migration as witnessed by me. They have not seen it, nor anything resembling it, therefore cannot properly imagine or visualise it, however well described. I can almost say that when I first opened my eyes it was to the light of heaven and to the phenomenon of bird migration—the sight of it and the sound of it. For migration was then and there on a great, a tremendous scale, and forced itself on the attention of everyone. Nevertheless, it is necessary for me to say something about it before entering into a relation of certain facts concerning migration which other writers on the subject have failed to observe or else ignored.

Birds, it is granted, migrate north and south, but here in this northern island, cut off from Europe by a comparatively narrow sea, and again by a wider sea from the African continent, the winter home of the majority of our migratory species, it is plain that they could never get to their destination—from England to South Africa, let us say—without deviating a good deal from the north and south direction. America, North, South and Central, is land pretty well all the way north and south from pole to pole, seeing that the only break is a few hundred miles of deep sea between the Magellanic region and the Antarctic continent.

Migration as I witnessed it was not composed exclusively of South American species: many of the birds were from the northern hemisphere. The rock swallow (*Petrochelidon pyrrhonota*), for example, that breeds in Arizona and New Mexico, and migrates to southern Patagonia; also the numerous shore birds that breed as far north as the Arctic regions, then migrate south to the Argentine and to the extreme end of Patagonia—or as near as they can get to the Antarctic. The spectacle of the migration of these birds that come to us from another hemisphere—from another world, as it seemed, so many thousands of miles away—was as a rule the most arresting, owing to their extraordinary numbers and to their loquacity, their powerful, penetrative and musical voices—whimbrel, godwit, plover and sandpiper of many species.

My home was an inland one, a good many miles from the sea-like Plata river, the vast grassy level country of the pampas, the green floor of the world, as I have elsewhere called it. There were no mountains, forests or barren places in that region; it was all grass and herbage, the cardoon and giant thistles predominating; also there were marshes everywhere, with shallow water and endless beds of reeds, sedges and bulrushes—a paradise of all aquatic fowl. Thus, besides the numerous shore birds, the herons of seven species, the crested screamer, the courlan, the rails and coots and grebes, the jacana, the two giant ibises—the stork and wood ibis—and the glossy ibis in enormous flocks, we had two swans, upland geese in winter, and over twenty species of duck. Most of these birds were migratory.

South America can well be called the great bird continent, and I do not believe that any other large area on it so abounded with bird life as this very one where I was born and reared and saw, and heard, so much of birds from my childhood that they became to me the most interesting things in the world. Thus, the number of species known to me personally, even as a youth, exceeded that of all the species in the British Islands, including the sea or pelagic species that visit our coasts in summer, to breed and spend the rest of the year on the Mediterranean and Atlantic oceans.

It was not only the number of species known to me, but rather the incalculable, the incredible numbers in which some of the commonest kinds appeared, especially when migrating. For it was not then as, alas! it is now, when all that immense open and practically wild country has been enclosed in wire fences and is now peopled with immigrants from

Europe, chiefly of the bird-destroying Italian race. In my time the inhabitants were mostly the natives, the gauchos, descendants of the early Spanish colonists, and they killed no birds excepting the rhea, which was hunted on horseback with the bolas; and the partridge, or tinamu, which was snared by the boys. There was practically no shooting.

The golden plover was then one of the abundant species. After its arrival in September, the plains in the neighbourhood of my home were peopled with immense flocks of this bird. Sometimes in hot summers the streams and marshes would mostly dry up, and the aquatic bird population, the plover included, would shift their quarters to other districts. During one of these droughty seasons, when my age was nine, there was a marshy ground two miles from my home where a few small pools of water still remained, and to this spot the golden plover would resort every day at noon. They would appear in flocks from all quarters, flying to it like starlings in England coming in to some great roosting centre on a winter evening. I would then mount my pony and gallop off joyfully to witness the spectacle. Long before coming in sight of them the noise of their voices would be audible, growing louder as I drew near. Coming to the ground, I would pull up my horse and sit gazing with astonishment and delight at the spectacle of that immense multitude of birds, covering an area of two or three acres, looking less like a vast flock than a *floor* of birds, in colour a rich deep brown, in strong contrast to the pale grey of the dried-up ground all round them. A living, moving floor and a sounding one as well, and the sound too was amazing. It was like the sea, but unlike it in character since it was not deep; it was more like the wind blowing, let us say, on thousands of tight-drawn wires of varying thicknesses, vibrating them to shrill sound, a mass and tangle of ten thousand sounds. But it is indescribable and unimaginable.

Then I would put the birds up to enjoy the different sound of their rushing wings mingled with that of their cries, also the sight of them like a great cloud in the sky above me, casting a deep shadow on the earth.

The golden plover was but one of many equally if not more abundant species in its own as well as other orders, although they did not congregate in such astonishing numbers. On their arrival on the pampas they were invariably accompanied by two other species, the Eskimo curlew and the buff-breasted sandpiper. These all fed in company on the moist lands, but by-and-by the curlews passed on to more southern districts, leaving their companions behind, and the buff-breasted sandpipers were then seen to be much less numerous than the plover, about one bird to ten.

Now one autumn, when most of the emigrants to the Arctic breeding-grounds had already gone, I witnessed a great migration of this very species—this beautiful sandpiper with the habits of a plover. The birds appeared in flocks of about one to two or three hundred, flying low and very swiftly due north, flock succeeding flock at intervals of about ten or twelve minutes; and this migration continued for three days, or, at all events, three days from the first day I saw them, at a spot about two miles from my home. I was amazed at their numbers, and it was a puzzle to me then, and has been one ever since, that a species thinly distributed over the immense area of the Argentine pampas and Patagonia could keep to that one line of travel over that uniform green, sea-like country. For, outside of that line, not one bird of the kind could anywhere be seen; yet they kept so strictly to it that I sat each day for hours on my horse watching them pass, each flock first appearing as a faint buff-coloured blur or cloud just above the southern horizon, rapidly approaching then passing me, about on a level with my horse's head, to fade out of sight in a couple of minutes in the north; soon to be succeeded by another and yet other flocks in endless succession, each appearing at the same point as the one before, following the same line, as if a line invisible to all eyes except their own had been traced across the green world for their guidance. It gave one the idea that all the birds of this species, thinly distributed over tens of thousands of square miles of country, had formed the habit of assembling, previous to migration, at one starting-point, from which they set out in successive flocks of a medium size, in a disciplined order, on that marvellous journey to their Arctic breeding-grounds.

Among the other species that swarmed in all the marshy places the glossy ibis was the most abundant, so that the whole air seemed laden with the strong musky smell of their plumage. In the autumn I have often watched their migration, usually in flocks of fifty to a hundred birds; and these would continue passing for hours, flying at a height of twenty or thirty feet, and invariably, on coming to water, dropping down and sweeping low over the surface as if wanting to alight and refresh themselves, but unable to overcome the impulse urging them to the north, they would rise again and travel on.

Then there were the species that had only a partial migration; birds that were residents all the year with us, but were migrants from the colder country to the south. One was our common dove (*Zenaida*), seen passing in flocks of many thousands; and, among the small birds, the common parasitical cow-bird. The entire plumage of this species is a deep glossy purple which looks black at a little distance, and in late autumn, when great flocks visited our plantation, the large bare trees would sometimes look as if they had suddenly put on an inky-black foliage. This bird too, when migrating from the southern pampas and Patagonia, would appear and pass in an endless series of flocks, travelling low and filling the air with the musical murmur of their wings and the musky smell which they too, like the ibis, give out from their plumage.

But of the smaller birds with a limited or partial migration, the military starling on his travels impressed and delighted me the most. Like a starling in shape, but larger than that bird, it has a dark plumage and scarlet breast. On the approach of winter it would appear all over the plains, not travelling in the manner of other migrants, speeding through the air, but feeding on the ground, probing the turf as starlings do, the whole flock drifting northwards at the same time. The flock, often numbering many hundreds of birds, would spread itself out, showing a long front line of scarlet breasts all turned one way, while the birds furthest in the rear would be continually flying on to drop down in advance of those at the front, so that every two or three minutes a new front line would be formed, and in this way the entire body, or army, would be slowly but continuously progressing.

How pleasant it was in those vanished years of an abundant bird life, when riding over the plain in winter, to encounter those loose, far-spread flocks with their long lines of red breasts showing so beautifully on the green sward! My memories of this bird alone would fill a chapter.

The autumnal migration, which was always a more impressive spectacle than that of the spring, began in February when the weather was still hot, and continued for three long months; for after the departure of all our own birds, the south Patagonian species that wintered with us or passed on their way to districts further north would begin to come in. During all these three long months the sight and sound of passage birds was a thing of every day, of every hour, so long as the light lasted, and after dark from time to time the cries of the night-travellers came to us from the sky—the weird laughter-like cry of rails, the shrill confused whistling of a great flock of whistling or tree duck; and, most frequent of all, the beautiful wild trisyllabic alarm cry of the upland plover.

Of this bird, the last on my list for this chapter, I must write at greater length; in the first place, for the purely sentimental reason that it was the one I loved best, and, secondly, on account of the leading place it came to occupy in my mind when I thought about the problem of migration. It inhabits, or formerly inhabited, a great portion of the United States of North America, its summer or breeding home, then migrated south all the way to southern Argentina and Patagonia, and it was, I believe, most abundant on the great level pampas where I had my home. In North America it is known as the upland plover, and is also called the solitary plover and Bartram's sandpiper—for a sandpiper it is, albeit with the habits of a plover and a preference for dry lands. In the Argentine its vernacular name is Batitú, from its trisyllabic alarm note—one of the most frequently heard sounds on the pampas. It is a charming bird, white and grey with brown and yellow mottlings on its upper plumage, beautiful in its slender graceful form, with a long tail and long swallow-like pointed wings. All its motions are exceedingly graceful: it runs rapidly as a corncrake before the rider's horse, then springs up with its wild musical cry to fly but twenty or thirty yards away and drop down again, to stand in a startled attitude flirting its long tail up and down. At times it flies up voluntarily, uttering a prolonged bubbling and inflected cry, and alights on a post or some such elevated place to open and hold its wings up vertically and continue for some time in that attitude—the artist's conventional figure of an angel.

These birds never flocked with us, even before departing; they were solitary, sprinkled evenly over the entire country, so that when out for a day on horseback I would flush one from the grass every few minutes; and when travelling or driving cattle on the pampas I have spent whole weeks on horseback from dawn to dark without being for a day out of sight or sound of the bird. When migrating its cry was heard at all hours from morning to night, from February till April: and again at night, especially when there was a moon.

Lying awake in bed, I would listen by the hour to that sound coming to me from the sky, mellowed and made beautiful by distance and the profound silence of the moonlit world, until it acquired a fascination for me above all sounds on earth, so that it lived ever after in me; and the image of it is as vivid in my mind at this moment as that of any bird call or cry, or any other striking sound heard yesterday or but an hour ago. It was the sense of mystery it conveyed which so attracted and impressed me—the mystery of that delicate, frail, beautiful being, travelling in the sky, alone, day and night, crying aloud at intervals as if moved by some powerful emotion, beating the air with its wings, its beak pointing like the needle of the compass to the north, flying, speeding on its seven-thousand-mile flight to its nesting home in another hemisphere.

This sound lives in memory still, but is heard no more, or will shortly be heard no more, on earth, since this bird too is now on the list of the " next candidates for extinction." It seems incredible that in this short space of time, comprised in the years of one man's life, such a thing can be. But here on my writing-table is the book of the first authority in America on this subject: William T. Hornaday, in *Our Vanishing Wild Life*, gives a list of the eleven species which have become wholly extinct in North America since the middle of the last century, most of them in very recent years; also a *partial* or preliminary list of the species, numbering twenty-one, now on the verge of extinction. The first list includes that beautiful bird, the Eskimo curlew—the fellow-traveller and companion of the golden plover referred to in this chapter. The list of those now verging on extinction includes the golden plover, upland plover, buff-breasted and pectoral sandpiper. This last species is not mentioned above, but it was perhaps the commonest of all the small sandpipers in my time, and from August to March any year was to be met with by any stream or pool of water all over the pampas.

All this incalculable destruction of bird life has come about since the seventies of the last century, and is going on now despite the efforts of those who are striving, by promoting legislation and by all other possible means, to save "the remnant." But, alas! the forces of brutality, the Caliban in man, are proving too powerful; the lost species are lost for all time, and a thousand years of the strictest protection—a protection it would be impossible to impose on a free people, Calibans or not—would not restore the still existing bird life to the abundance of half a century ago.

The beautiful has vanished and returns not.

XII

The migrants' cry—Unrest previous to departure—Upland plover, swallows and others—Demonstrative and undemonstrative species—Parental solicitude—Swifts and house-martins—Strange case of a captive cuckoo—Night migration of diurnal species—Woodland migrants on the pampas—Reluctant migrants—Thistledown as an illustration—Migration of a troupial—Fear in birds and false associations—Direction of migration—Unrest—Flying north—Migration of rock-swallow—Pull of the north—Perturbations in migration—Upland plover.

WHEN in my boyhood I listened day and night to that cry of the upland plover, it came to me that the explanation of the passage birds' cry given in the books could not be true, or not true in all cases. Birds, it was said, emitted these calls as a sort of watchword, and to prevent their followers from scattering. Certainly it was not true of the upland plover, seeing that it travelled alone day and night. Moreover, the sound was not a call but a cry of alarm—the cry invariably uttered by the bird, when flushed by man or dog, as it rushed wildly away through the air.

I then made the further discovery that this same cry of alarm was frequently uttered by the bird, without visible or audible cause, on the eve of migration, or rather for some days previous to departure. The time varied every year, from two or three or four to ten or twelve days; the cry and action always being simultaneous, the bird springing up and rushing away as from an enemy, and after flying forty or fifty yards dropping down again.

After seeing this, I began to pay close attention to the other migrants, mostly the small birds, and especially to the swallows, of which we had seven species in the country. Five of the seven were very common, and their habits familiar to me; probably not fewer than fifty pairs of four of the five species bred in or under the eaves of the house and outhouses of my home, and in the trees in the nests of other birds. The fifth species, a small *Atticora* with the habits of a sand-martin, bred in holes all about the plain, only it did not excavate the holes itself, but took possession of those made by a small mining species, called the "little housekeeper." All these swallows, excepting the tree-martin, which lived in pairs during the breeding season and was afterwards solitary or mixed with swallows of other kinds, had the habit of assembling in numbers previous to migration. The more I watched these birds the more convinced I became that they too, like the upland plover, were subject to a strange disquiet before the time of departure. They kept close and sought the highest places to rest on, especially the large purple martin (*Progne*); these would assemble on the tops of the tallest trees, while the smaller kinds would sit on the fences, roofs and any other elevation. They would rest silent and motionless, as if brooding; then suddenly, with cries of alarm, they would spring into the air as if they had seen a hawk, and after rushing and wheeling about the air for some time, return once more to the resting-place.

This same spirit of unrest, or of a "state of nerves," was observable in a majority of the migrants, and manifested itself in an increasing wildness; in signs of suspicion or fear, and extreme readiness to take alarm at slight causes which would not have moved them a short time before. They were like the bird population of a marsh or copse or plain where a hawk has suddenly descended to strike down and carry one of them off. The excitement was not so acute, but it did not pass away in a little while to leave them at peace, as after the raid of a falcon; it continued from day to day, and increased till the moment of going.

This spirit of unrest was not visible in all the migrants; it was most marked in the most volatile species, the swiftest of wing and wildest; in others in a less degree, down to those in which it was not noticeable. There were, in fact, with regard to this as well as to other emotions which birds experience, demonstrative and undemonstrative species.

The differences in behaviour here are similar to those we see in the manifestations of parental solicitude. Many species, when the nest with eggs or young is in danger, are excited in a violent degree; they scream their loudest, and in some instances are so carried away with anxiety and rage that they will attack any animal, however dangerous, or man himself, as I have been attacked in South America again and again by plover, by hawks, and even by small birds. And here, too, there is a gradation in the display of feeling from this extreme down to the birds that look on when their nests are robbed, or their young taken and destroyed, and make no sign. But if at such times you look at the parent bird closely, you will see that its agitation is not less powerful and painful than that of the bird that wheels screaming about your head.

To take a glance at English bird life, I should say that the swift is one of the demonstrative species. In a book of mine, *Afoot in England*, I have described the behaviour of a crowd of these birds in a seaside town in Norfolk, belated breeders in August urged by the migratory instinct into a sort of frenzy before they could bring their young off.

In another book—*Adventures among Birds*—I described the efforts, painful to witness, of a pair of house-martins in October, in cold rainy weather, to induce their full-grown young to come out and fly away with them, and how as soon as the last of the young had perished from cold and insufficient nourishment in the nest, the released parents vanished from the scene.

Again, we are familiar with the fact that caged migrants are stirred by this impulse to fly away, in some instances so powerfully that they injure and even kill themselves in their efforts to escape from their prison.

One of the most extraordinary instances of this inherited impulse to fly—to escape, as it were, from some imminent danger—of the captive migrant is related by Benjamin Kidd in his posthumous book, *A Philosopher with Nature.* The bird was a pet cuckoo which had been reared from the nest, and he gives the following account of its action:

> As the year waned and the time for the migration of my young cuckoo approached and passed, its behaviour grew interesting. The bird always became very restless in the evening. Being much attached to me, it generally settled at last so as to be near me, on the stationery case on the table on which I was writing, in the dim light thrown by the upper surface of the green shade of the reading-lamp by which I worked. Here, as the hours wore on, the same thing happened every night. After a short interval the muscles of the wing began to quiver, this action being to all appearance involuntary. The movement gradually increased, the bird otherwise remaining quite still, until it grew to a noiseless but rapid fanning motion of the kind one sees in a moth when drying its wings on emerging from its chrysalis. This movement tended to grow both in degree and intensity, and it usually lasted as long as I sat up during the night. In the early stages of this mood the bird responded when I spoke to it; but in time it ceased to do this, and became lost in a kind of trance, with eyes open and wings ceaselessly moving. Brain, muscles, nervous system, and will, all seemed inhibited by the stimulus that excited it. The bird became, as it were, locked in the passion of that sense by which the movements of flying was thus simulated. It was one of the strangest sights I have ever witnessed. This young migratory creature of the air, which had never been out of my house and which had never known any of its kind, sitting beside me in the gloom of our northern winter and in the dim lamplight, and by a kind of inherited imagination, in one sense, flying through the night, leagues long, over lands and oceans it had never seen.

I should say that the rapid motion of the wings as in flying gave relief to the bird, just as I believe that when the migrant is once launched on his passage, flying with all his power, he finds relief from the sting of the impulse, and its accompanying sense of disquiet or fear. And no doubt fatigue, hunger and thirst tend further to allay the sense of disquiet, so that the traveller is able to descend to earth to feed and rest until, restored, the pain returns to urge him on his way.

It seems marvellous to me, this account of a pet cuckoo driven while in captivity—stung, we may say—into simulated action where action was impossible, by a motive, an impulse, an instinct, beyond all others in its power over the bird; escaping and flying by night, and night after night, straining towards its distant bourne over a thousand leagues of land and sea, and all the time sitting motionless on the table in a room by the dim light of a reading-lamp!

The very fact that strictly diurnal species do travel by night is a proof of the power of the migratory impulse.

Montagu, the author of the *Dictionary of Birds*, and an observer of birds all his life, refused to believe that such a thing was possible. He says, truly enough, that there is nothing birds that see and have their active time by day fear so much as the dark. At the approach of night they hide themselves away and fall asleep, and if disturbed are in terror and act as if blind or senseless. Yet we know that he was wrong, that many diurnal species (and I would place all or most migratory cuckoos among them) do travel by night, and that the impulse to escape, to rush away, becomes in these night-travellers most active, painful and insistent in the waning light.

There is another matter closely connected with the subject I have been considering; and this relates to the peculiar conditions of the country where I first observed migration—a sea-like expanse of level grassy plain without a native tree-vegetation excepting in a few widely separated spots. When these plains, or this one great continuous plain, was settled on by Europeans, they planted groves and orchards around their houses. These small plantations were far apart, scattered about all over the pampas, a purely grazing country, and stood up conspicuously at a great distance like islands of trees on the green sea-like surface of the land. One would suppose such conditions unsuited to woodland species; for the wood is their true home, the only safe place for them, and they naturally fear the wide open flat space, where there is no refuge, no escape, from the ever-present bird of prey on the watch for them. I found that there were, in fact, quite a number of summer visitants to my district that never ventured over the wide open spaces; they came south, but kept strictly to the forest growing on the marshy shores of the Plata river. Anywhere in this forest I could see a dozen or more species any day that were never seen out of it, not even in the plantations within a few miles of the coast, since to get to them they would have to fly across a few miles of treeless country.

Nevertheless, the wave of migration brought to us a considerable contingent of woodland species each spring. Doubtless many were night-travellers. Thus, in the seven or eight acres of shade and fruit trees at my home, our spring visitors included goatsuckers, cuckoos, humming-birds, swallows, finches, tanagers, troupials, tyrant-birds, and wood-hewers of several species.

Here, despite my continual watchfulness, it was as in England—the birds that were absent yesterday and for the past six months were present to-day, and singing all about us. It was, indeed, the rarest thing to witness the arrival of any bird; so rare, that on one occasion it was a matter of great joy to me when, walking on the north side of our plantation one spring day, I spied a small bird slowly and laboriously flying towards me over the plain, and recognised it at a distance as the very bird I had been waiting and watching for, the brilliant little scarlet tyrant-bird—most brilliant in colouring and most musical in its small bell-like voice of all our little birds. Arrived at the trees, he alighted and was doubtless glad to reach his summer home and refuge—that oasis of trees on the wide grassy desert.

When the time came, in February, March and April, for the migrants to return to the north, it was a different matter. The birds, as I have said, were then manifestly in a state of disquiet: one saw from their behaviour how they were moved—one may say driven—reluctantly from their place by that strange influence, that fear, which affected them in different degrees, so that from the time migration began it was well-nigh three months before it ended with the departure of those that feared most to go and clung most tenaciously to their leafy homes.

Let me give one instance of this reluctance of the woodland species to leave all shelter of trees. This relates to a species of cuckoo which did not breed in our plantation, but I recognised the bird when I saw it, as I had made its acquaintance the summer before. It was one of the North American cuckoos of the genus *Coccyzus*, an exceedingly rare species in Argentina—so rare, that it was not known to visit that country till I found it. This solitary bird appeared in our trees late in the season, after all the early migrants had departed. I first caught sight of it on the trees growing on the north side of the plantation. Beyond that was the level treeless plain. I kept it under observation for three days, and could find it at any hour skulking in the foliage at that same spot, afraid, as I imagined, to quit its shelter. Then it disappeared, and it at once occurred to me to pay a visit to the next plantation, situated due north from ours and plainly in sight, to look for it there. And there, sure enough, I came upon it on the north side of the grove, skulking in a skimpy thorn hedge. Again, on the following day, I found it in the same place; but on the third day it had vanished, and the next plantation to the north was too far off for me to try to keep up with it.

This reluctance of the woodland bird to cross an open treeless space is like that of the migrants on coming to the sea. I see it every year on our south coast, when swallows and other birds sometimes spend days before they venture across.

One must constantly bear in mind that all birds are reluctant to quit their homes. His home, his little territory, is the one spot on earth the bird knows—every hill, wood, stream, tree, bush, every grass, is intimately known to him: his feeding and recreation grounds, his safe roosting-place, his shelters and refuge from inclemency of weather and all dangers, are there, and outside of its limits it is all a strange world, and he a stranger in it. He will cling to his home even when persecuted, and robbed year after year of eggs and young; and even when it is destroyed, as when new land is brought under cultivation, and when forests are cut down or blasted by fire, he will continue to haunt the spot, as if unable to adapt himself to new and different surroundings.

Among the notes (and there are hundreds of them) recording my observations during my early years on what I called the "Passion of Migration," there is one in which I compare the autumnal migration of the birds to thistledown as I used occasionally to see it.

The cardoon thistle, a big plant which in my time covered hundreds of square miles of the plain in my district, has a very large flower, twice as large as that of the artichoke, which it resembles, and the down it produces is correspondingly large. In the late summer, at the end of January, on a windy day the sky was often seen full of the great silvery floating globes of down. When the wind fell they would settle on the earth in such abundance that the whole plain would be thickly sprinkled over with them, so that it would have a misty or downy appearance. I have sat on my horse on a calm hot day in late summer viewing the plain, burnt yellow after the two hottest months of December and January, stretching level before me to the horizon, and as far as one could see glistening with the million million balls of down lightly resting on the surface of the grass. Then there would be a slight tremor in the down at the first faint breath of a coming wind; a tremor that would momentarily increase until the topmost globes, resting lightly on the surface, would begin to sway and move and finally rise, to float off like soap bubbles, while still others would tremble and sway, but fail to rise because obstructed by the grasses they rested against. These too would eventually free themselves as the current of air increased in strength, and would float too; while others, still more obstructed, would remain behind until, the wind still increasing, even these would be torn away from the blades and stems that held them and rise after the others, and eventually the whole air would be full of the down flying before the wind.

Even so it is with the birds, I have said, when they are touched with that breath—that first disturbing influence and impulse; when the first tremor, the first indication of it, is seen in their behaviour, and when it increases until first the most volatile and swift-winged and most sensitive among them are lifted up and carried away, while others still hold on to their places, to be at last torn away by a power that overcomes all resistance—whirled away on their long aerial voyage.

Nor is it only the woodland birds in that woodless land that are seen to cling so tenaciously to their homes: the tenacity, the shrinking from that long voyage over an unknown hostile waste, is equally strong in some species that live and spend their summer in the open grassy plains. I am tempted to give one remarkable instance of the kind. This refers to a migratory troupial, *Leistes superciliaris*, a beautiful starling-like bird resembling the military starling in its dark plumage and scarlet breast. That is the male: the female has a modest colouring, and differs in habits from her mate. It is a solitary bird that comes alone from the north in spring to inhabit and breed on the open grassy plain. The male finds a tall grass or thistle or herb of some kind which he makes his stand, and there he spends most of his time, looking very conspicuous with his scarlet breast, and at intervals he springs aloft to utter his song in the air, then drops back to his stand. The female lives alone also, but skulking like a landrail under the grass. After breeding they again separate, and in March and April the males, alone or in small companies of three or four, migrate north. A little later the females depart, after uniting in parties of about half a dozen. It looks then as if their fear had brought them together, when one watches them on their passage. They come over the plain, flying north and very low, just above the surface, and their flight is like a series of dashes, for now they dash away to this side, now to that, and every time they come to a spot where there is thick long grass, the sort of cover they live in, they dash into it as if they were being pursued by a hawk, and after remaining a minute or two in hiding, they recover courage enough to set out again to continue their eccentric progress.

We see, then, from all this, that what I have called the "Passion of Migration" is an emotion which accompanies the instinct, the act; that it is fear, and is not the cause but an effect (an incidental effect, one may say) of the impulse impelling birds to migrate.

Fear in birds is caused by something seen or heard: scent does not come in here, as it does in the case of mammals. Something inimical in the bird's life, which he recognises as a danger, in some instances by experience, but as a rule by tradition handed down from generation to generation. Thus, a bird in England flies from a man, not because he has been hurt by a man (although this does sometimes happen), but because his parents and other adults he consorts with after leaving the nest, have invariably uttered a warning note on his approach. This has infected him, and for the rest of his life man is viewed as a dangerous being, and the lesson is handed on to his offspring. The effects of this lesson, we know, may be overcome, and some of us have stroked eiderdown ducks and thrushes and blackbirds sitting on their eggs without frightening them, and I have also been accustomed to have wood-pigeons in the London parks fly on to my hand to be fed. But in a vast majority of wild birds it is practically an ineradicable habit, although, as we see, not instinctive nor yet an inherited habit.

But what the wild bird fears most acutely is the sight of a bird of prey, because, albeit traditional like the fear of man, it is an older fear, which has become instinctive (or so I think), and the enemy, from the bird's point of view, is the more deadly one; for man, an often-seen creature, is not always harrying the bird, but the hawk is out to kill always, and each and every bird is in terror lest it should be struck down. Now the fear in the migrant has no visible nor audible cause; nevertheless, it is also an associate feeling, and can only be ascribed to a state of nerves due to something else affecting the bird in a disquieting way; and this disquiet, this mysterious trouble in it, which increases until it is a pain, simulates the state the bird is in when he sees his deadly enemy or when the trouble and terror visible in the bird population surrounding him produces the same effect. A state of suspicion, of alarm, of readiness to rush away into some place of safety. This delusion, or false association as it may be called, is common enough throughout the animal world, and even human beings, who, it has been said, are a little lower than the angels, are subject to it. Thus, my neighbour's evil eye must be the cause of the otherwise inexplicable fact that my cow or my baby has fallen sick and doesn't get well in spite of all the drugs I make it swallow. It is very common in the dog, which, according to the Youatts, Lubbocks and other authorities, ranks next to man in his mentality. I have seen a good deal of it in the dog. He is by nature a greedy, jealous and quarrelsome beast, and in his frequent rows inflicts and receives many painful bites: he thus knows what pain is, and the cause of it. If he suffers from some malady—rheumatism, let us say—when he gets a twinge, he associates it with former experiences of pain, and he can make a pretty good guess as to the cause of his twinge. He turns round and growls savagely at the other dogs, who are surprised at him, and he is still more surprised at their surprise. But this innocent demeanour of the others doesn't always placate him, and in some instances he will spring up and savagely attack the dog next to him to avenge the insult.

The emotion described as the accompaniment of migration, which probably intensifies and may be regarded as ancillary to the impulse and the act, does not perhaps bring us any nearer to the origin of the instinct itself; nevertheless it is a fact hitherto unnoticed, which if well considered may be of assistance in dealing with the problem. I discovered it for myself in my youth, and the longer I observed birds the more convinced was I of its truth: and now, after half a century has elapsed since I made the notes I am drawing on in the early seventies, I am of the same opinion still.

There are two other subjects concerning migration in its inception to be touched on in this place, as they connect themselves in my mind with the one I have been discussing—the impulse which leads to migration, and the passion of fear which accompanies it.

The first of the two concerns the direction of migration; the second, the perturbations or irregularities to which it is occasionally subject. Keeping still to my own observations on the autumnal behaviour of birds previous to departure, I have asked myself: When, or how soon, does this trouble in the bird, which manifests itself as fear of an invisible danger or enemy from which it seeks to escape, first incline it to the north as the side where safety is to be found? I failed to detect any special inclination to fly to that side in the swallows, even when the preliminary disquiet and agitation lasted many days, during which the birds would rise or rush away with cries of alarm to this side or that and scatter and then return to their perch and their brooding intervals, until the very eve of their departure, for you could then see that when they rose or sprang away into the air it would be to the north side. It was different with the upland plover: from the very beginning of its period of unrest it invariably, when rising, rushed off to the north side.

And here again I would emphasise the difference in the behaviour of different species when affected by the same influence and impulse. It is, to my mind, an extraneous influence—a "breath," as the poet of *The Seasons* has called it, and he could not have found a better metaphor. Touched by the breath as by a coming wind, the migratory birds were compared by me to globes of thistledown, resting in still weather on the grass, trembling at the first faint movement of the air, and finally lifted and carried away by the increasing wind. It was perhaps a better simile or comparison which occurred to me later—I think it was when riding through the bush on the Patagonian table-land in a strong wind, and noting how the trees and bushes of various kinds were acted on by the current. Some with slender boles, pliant branches and a loose feathery foliage would be swayed about and bent almost to the ground at every gust, others would bend a little, and still others not at all, although their whole foliage trembled violently, and finally some with stiff holly-like leaves would scarcely show a tremor. Migration once started, the line of flight was almost invariably due north in all species, although they travelled at different heights. The very large birds—wood ibis, swan, spoonbill, etc.—journeyed at so great a height they were scarcely visible in the sky. Plover and shore birds generally, inland-breeding gulls, duck and pigeon and the glossy ibis, travelled at a moderate height; swallows lower still, and lowest of all were the small short-winged birds—all the kinds whose only refuge when a hawk appears is on the ground.

The most notable exception as to the route in all these birds was the rock-swallow in its passage from South Patagonia to Arizona in North America. The manner of this bird when migrating and the direction of its flight was a continual puzzle to me. Its movement northwards began in January, and continued for about a month, sometimes longer. But its appearance was irregular; in some seasons very few birds appeared, in others they were passing in numbers any day all through February; they did not travel in flocks, but singly, though as a rule many birds were in sight and sound of each other. They travelled in a singularly leisurely manner, stooping or rising and sweeping in wide circles about, hawking after flies, and continually emitting their clicking, jarring and twittering notes; and the direction of their flight always appeared to be east of north. This would eventually bring them to the Atlantic side of the continent, and their entire journey would form an immense curve at least a thousand miles longer than it need be, since a direct line to their breeding-ground would be on the Pacific side.

One year in April, a full month after the last of the swallows had vanished, there occurred one of those rushes of belated migrants which were not uncommon, and I then saw a lot of rock-swallows, and saw them well, as I was out on horseback and they passed directly over me, not more than thirty feet from the ground. They were not now travelling in the way I had been accustomed to see them; they were packed together in a flock just like our chimney-swallow on its migration, flying at their greatest speed and due north. This slight alteration in the direction of its flight and complete change in its manner of travelling gave me the idea that in the early stages of migration in the rock-swallow and other species the pull of the north is not so powerful and insistent as to prevent the birds from deviating to this side or that according to the abundance of food or other conditions of the territories they pass over, but that as time progresses the pull increases in power and brings them back to the right line.

The power of this pull was observable in all the late migrants during these rushes, which often came a month after the usual time of the ending of migration, and it was easiest to observe in plover and shore birds.

When, out on horseback in the morning in late March or in April, I encountered flocks of these belated travellers—plover, curlew and sandpiper—I often tried to force them to fly south. They appeared tired as if they had been travelling all night, and were hungry and seeking food in the short dew-wet grass, but always with their heads to the north. Not a bird would be seen to turn aside in any other direction. Riding to the north side of the flock, I would suddenly wheel round and charge at it, and up they would spring, almost vertically, and fly over my head to a distance of forty or fifty yards, then drop down and go on looking for something to eat, still walking north.

One can but infer that the attraction, the impelling force—the "pull of the north," as I have called it—increases until in the belated travellers it is an actual physical pain, a pain and a sense of extreme fear, which is intensified if the bird attempts to fly south.

Then as to the perturbations or aberrations in migration also manifested in the migrant previous to departure—the irregularities which suggest that the cause of migration, the force behind the impulse, is itself subject to permutations and aberrations, which affect the nervous system of the migrants. On this subject, together with the one just discussed, the observations I made would fill a very long chapter, but I will confine myself to one, and this one relates to the upland plover, the bird I have had to mention so many times.

The north migration as a rule begins about the 15th of February and continues to the 15th of March, and it is at the beginning of the former month that the disquiet becomes noticeable. Now on one occasion the season of unrest began much earlier, in the month of January, increased from day to day and week to week in the most extraordinary way, and continued to about the middle of March before the birds began to fly north, the migration continuing through March. On any day in February when out riding I would see from time to time a bird spring up with its wild alarm cry and flight, and after going a little distance drop down again. Then in a minute or two another, farther away, would start up with its cry; and sitting still and watching and listening, I could see the birds rise up here and there all over the plain—rise with a cry, then settle down again; and if one rode a hundred miles to any side he would find it the same everywhere. The birds were in a continual state of agitation, of fear; and though this state began so much sooner than usual, the actual migration did not begin till a month later than the usual time.

If in this chapter I have reverted again and again to that one subject of the behaviour of birds prior to migration, it is because these simple facts, which seem to me to be essential in studying the problem, have never been recorded or considered; also that they could not have been known to closet naturalists who have constructed theories about migration, nor can they be known to anyone except to someone like myself who has lived long and intimately with birds until their language has been mastered—language of sound and motion—which tells you what they feel and what they mean.

XIII

No hard and fast line between migrants and non-migrants—Swallows and partridges—Contrasted behaviour in two mocking-birds—Spur-wing lapwing—An instinct in a state of flux—Migration in other creatures—Fishes and insects—Kirby and Spence speculate—Spiders—Mammals—Migration a danger—Sand-grouse and the "Tartar invasions of Europe"—A "sense of polarity" the origin of migration—A trace of this sense in man.

ONE of the first facts confronting us concerning the migration of birds is that there is no dividing line between migrants and non-migrants. One would say off-hand that there is a great difference indeed—a very hard and fast dividing line between the swallow, let us say, and the partridge. It is not so when we come to consider that swallows are not always migratory; that there are regions where they remain all the year round; that in some countries this migration is only a partial one; that even in a country so far north as England, where the flies they subsist on do not exist in winter, the impulse to migrate fails in some individuals, and these remain in a torpid condition like bats and female bumble-bees and wasps, and no doubt perish in most instances before the return of warm weather.

When we come to a milder climate, such as that of the Argentine pampas, every observer must see that a considerable number of one of the most common house-swallows, *Hirundo leucorrhoa*, remain hidden away in a torpid condition during cold weather, since they could not otherwise reappear on any bright warm day during the winter months as they frequently do. Another species, a small *Atticora*, has actually been found in a semi-torpid state among the roots of the tall grasses on the pampas in winter.

Nor is it improbable that even so sedentary a species as the partridge is wholly unaffected by the disquieting impulse. We know that the red-legged partridge made its appearance on one or two occasions in England before its final introduction into this country, and these strangers must have flown over the Channel. The quail, a small partridge, is one of the strictest migrants, yet we know that some individuals do not go with the wave in autumn, but remain and live through the European winter.

Let me now give an example in two closely allied species of the two extremes in bird behaviour prior to migration—excessive disquiet in the one, while the other appears quite unmoved. Patagonia has two mocking-birds—the common, and the white-winged or white-branded species; the first is an all-the-year-round resident, the other a migrant from Brazil and Bolivia. It appears in September or October, breeds and departs in March, but long before its departure its habits change. The most voiceful of all our songsters during the summer months, it is now silent except for the harsh alarm cry uttered when taking flight. It becomes excessively wild, and perches on the topmost twigs of trees and bushes, and on the slightest cause flies up high in the air and away to a great distance—often quite out of sight. Meanwhile, the other species, which inhabits and breeds in the same thickets, not only keeps its place, but appears to be in the same temper as at other times of the year. It sits as always on the top of a bush, trilling out a few notes from time to time, then listening to the notes of its neighbours, then singing again, and again listening. Yet we know that many individuals of this sedentary species of a placid temper do migrate to North Argentina, Bolivia and Brazil. We may say, then, that this Patagonian mocking-bird has a migration similar to that of our song-thrush and red-breast. These two species are resident with us, but we know that a very large number do migrate, crossing the Channel on their passage, but whether many or few return we do not know.

Another instance is that of the spur-wing lapwing of the pampas. It is a non-migrant, and no bird is more strongly attached to its home—to the portion of ground it lives on, and of which it is so jealous that it furiously attacks and drives away other lapwings and even plover, or other species that venture to trespass on it. Winter and summer, they occupy the same ground. I have known a pair of these birds that occupied and bred on the same spot year after year, and when the ground was enclosed with a wire fence and ploughed they refused to quit, but laid the eggs in a furrow, and after the harrowing which destroyed the first eggs, they laid again, to lose their eggs again when the corn was hoed. And for three years they persisted in trying to breed on that one spot, which was their own home.

All over the country it was the same: thousands of miles of unenclosed grazing lands were all parcelled out among these birds, each pair in possession of its own well-defined territory. Yet even this bird, so bound to its own place—the spot of earth it claims as its very own and holds against all intruders—even this species is not unmoved by the migratory impulse, nor wholly without a migration. Towards the end of summer a few are to be seen every day, at all hours, flying steadily due north at a considerable height; and it is plain to see that these are migrating. And as with the spur-wing lapwing on the pampas, so it is with hundreds of species all the world over—resident species and races of which many individuals migrate. And no doubt the reason of it is that the impulse which drives birds to migrate weakens in races inhabiting districts where the conditions are favourable all the year round; that the weakened impulse is not strong enough to overcome the attachment to place—the intense reluctance of the bird to abandon its home; that the impulse is stronger in the young, and that in species in which the young are persecuted and driven from place to place, first by their parents then by other adults, jealous of intruders, as it happens with this lapwing and with our red-breast and numerous other species, the impulse is unrestrained and eventually sets them off.

Looking at the whole bird world, from the species in which the migratory instinct has attained its highest perfection, as in the swallow, cuckoo and nightingale in this country and the upland plover and other plover and sandpiper in America, down to those with a partial, an occasional, an erratic or spasmodic migration, and to those in which some individuals migrate or have no migration at all, yet do exhibit some signs of disquiet or disturbance of the season, we see that there is a gradation; and I conclude that the impulse (and the instinct) is in a continual state of flux, that it waxes and wanes and appears to die out in the adults of some species and to revive in their offspring, and is like that elaboration and degeneration so admirably described by Ray Lankester as perpetually going on side by side in the organic world. And if this be so, there is no necessity to set up the hypothesis of the origin of life in the north polar regions, with successive glacial epochs to make it appear more plausible, and an inherited memory that can fall asleep for a thousand years to wake up refreshed and resume the old business just where it was left off. Inquirers into the problem would do better by sweeping all this aside—forgetting all about it or regarding it merely with amusement, like a castle or tower built by a child with his toy bricks—brick on brick as high as he can make it before, at a careless touch, the whole ill-balanced structure comes tumbling down.

All these theories, we have seen, are based on the one fact of a seasonal north-and-south migration in birds, and all fail when other facts, or when all the facts, are considered—that is to say, the facts concerning bird migration. What shall we then say of them when we look from birds to other beings—fishes, mammals, insects, and even spiders? For in all these classes we find migration, and it is quite probable that the inhabitants of the sea are as regularly and as powerfully moved by the impulse as the fowls of the air.

The subject of fish migration is now being investigated; from personal observations I know nothing about it, and as to insect migration I know very little. The little I have seen, however, has served to convince me that there are great occasional migratory movements corresponding in time and direction to the seasonal migration of birds, and I conclude that they are due to the same compelling force. From what one has read, one thinks chiefly of locusts, dragon-flies and butterflies in this connection.

The grasshopper plague was of frequent occurrence on the pampas in my time; but this insect was incapable of sustained flight, and the movement was a sort of drifting, flying and settling and feeding as they went, as a rule in a southerly direction. The migratory locust was unknown in southern Argentina. Only once, about midsummer, we saw a cloud coming from the north, which turned out to be a flight of locusts that must have travelled several hundreds of miles from the sub-tropical northern provinces of the country. The cloud settled in my district, and there remained and laid its eggs. People looked apprehensively at what would happen in the following summer, when these millions of packets of little yellow eggs would hatch and the young arrive at maturity, since one of these huge insects would devour as much green-stuff in a day as half a dozen grasshoppers. And grasshoppers were bad enough. But the eggs never hatched; the locusts had flown too far south, where there were occasional sharp frosts in the winter, and the eggs had probably been spoilt by the cold.

As to dragon-flies, great migrations of two or three of the large species were common on the pampas, always in a north-east direction, since the insects invariably appeared flying before the south-west wind, called *pampero*, a wind that in summer, as a rule after a spell of hot weather, springs up suddenly and blows with extreme violence. From a minute or two to as much as fifteen or twenty minutes before the wind struck, the dragon-flies would appear flying at their utmost speed, so that when out on the plain on foot or horseback one could not tell what those swift creatures were that came flashing and rustling past one's face. They always appeared to be in a panic, and if the wind was close behind, on coming to a grove or plantation they would rush into it for shelter and there remain, and on the following morning they would be seen hanging from the trees, clinging together in masses, like swarms of bees, and the masses would sometimes cover entire trees as with a brown and crystal drapery. These panic rushes from the wind are in a sense migrations, but one hesitates to put them, as to their cause, in the same category as the seasonal movements of birds, fishes and insects. One can only suppose that these dragon-flies have a sense of the coming atmospheric change; that it is an impulse more sudden and violent than that of migration, and inspires them with a greater terror, and sends them flying hundreds of miles over a parched waterless region at such a speed that they are able to keep ahead of a wind blowing as a rule at a rate of about seventy miles an hour.

Twice on the pampas I witnessed a great butterfly migration: on both occasions it was the same insect, a species of *Vanessa*, resembling our large tortoiseshell, and the commonest as well as the hardiest of all our butterflies. Both of these migrations occurred in spring, about the middle of September, and the direction was the same as with the birds arriving and passing on to the south. They did not migrate in clouds or masses, as in many other instances of butterfly migration on record; like that one, for instance, described by Darwin when the *Beagle*, off the Patagonian coast, was in a cloud of white butterflies, so that the sailors cried out that it was "snowing butterflies."

The red *Vanessa* butterflies travelled close to the surface, singly or in twos and threes together, passing at intervals of a second or two, so that it was easy to count them as they flew by. On the occasion of the second migration I marked a space of a few feet, staked at the sides, and counted all those passing over it in an hour, and calculated that 65,000 butterflies had passed over every hundred yards during the flight, which lasted from nine o'clock in the morning to a little after five in the afternoon. The breadth of the migration column was about three miles. On the following day they continued for about seven to eight hours passing in the same numbers, then the numbers began to decline, and on the third day the whole migration finished.

During the whole time of my watching, the butterflies kept always so close to the surface as to be almost touching the grass, travelling always at the same swift rate of speed, and never did I see one alight to rest.

It cannot be supposed that this migration of butterflies, travelling in their millions over a vast tract of country, had a different cause to that of bird migration going on at the same time over the same tract and in the same direction.

Migrations of this character of butterflies and many other insects have been witnessed and described by hundreds of observers, so that there is an abundance of material for the thinkers to work on, but so far the only speculation on the subject I have come across is in Kirby and Spence's great work: I find it in the early unabridged editions in four volumes. They speculate as to the reasons which induced the Creator to endow these insects—butterflies, beetles, dragon-flies, bugs, locusts, aphides, and others—with such an instinct, seeing that they are only influenced by it occasionally and that it invariably leads to the destruction of the entire migrating host, as there is no return migration, and they are in most cases blown out to sea and perish there. They concluded that they were forced to migrate for this very reason—to get rid of them on account of their excessive numbers. And it was not an improbable notion for the time they wrote in, during the early years of the nineteenth century—quite half a century before the doctrine of Evolution came into vogue, when the idea of such interpositions or interferences with the order of Nature began to fall into disregard.

On the migrations of spiders I can throw no light. The grass in any temperate region is alive with the multitudes of these little aeronauts: on the pampas they are so abundant that when the sun is low in the west it casts a broad silver track over the grass to the observer's feet, like moonlight on the water, so covered is the surface of the grass with their gossamer webs. And all the time, all the summer long, one can see them perpetually drifting into the air, to this side or that. Twice only have I witnessed great migrations, when thousands of millions of the minute creatures must have risen high into the air at the same time, since for a whole day the sky was full of the floating webs. This was in the late summer, and a gentle wind was bearing them away in a north-west direction.

On the second occasion it was a local migration in April—the very end of the migrating season—and the direction was north, owing to a south wind at the time. It really looked as if the little creatures had waited for just that wind, since for several days they had been coming up from the moist green grass of a valley to the higher, drier land on its border on the north side, and there they remained congregated in incredible numbers until the south wind sprang up and took them away. Looking closely at them, they appeared to be in an intense state of excitement. Every spider was trying to get away from the others to some point above them, and would no sooner throw up a thread than it would strike another thrown at the same instant, and the little creature, knowing the cause of the obstruction, would turn upon and savagely attack the other spider, and drive him off. Every minute one could see a score of incidents of this kind, and in spite of this trouble numbers were continually getting away.

How marvellous it seemed that these minute beings, averaging about a tenth of an inch in length, though some were much larger and they were of at least five or six different species, appeared to know so well just what to do and how to do it. The difficulty they had in getting off seemed to make them desperate, as if they also knew that every time they failed to rise they were so much the poorer in spinning material and in that dynamic energy with which these atomies are supposed to be charged, which enables them to dart out a line of eight to twelve inches long to lift them from the earth. Every failure thus diminished their chances of getting away, seeing that it was necessary in each case to cut the line and create a new one. I watched their efforts for two days, and then it was over, for though the wind was still favourable and many remained in the spider belt, these had apparently used up all their energy and made no further attempt to escape.

About the migration of mammals I can only say, from my own observation, that bats are strictly migratory all over the pampas. Everywhere in that flat country of some 60,000 square miles extent, bats appear with the birds in spring, arriving later than the early spring visitors, and vanishing with them in March and April. Anyhow, I never found a hibernating bat nor heard of one, although they were abundant all the summer, hanging in the trees by day, where in an hour or two I used to be able to find and capture a dozen or twenty, just to release them in a large room to observe them in confinement.

It is, however, my considered belief, which may go for what it is worth, that the impulse and disquiet is in mammals as well as in birds, fishes and insects, albeit it does not lead to actual migration except in some species and on rare occasions.

I have long suspected that our common little shrew is powerfully moved by the impulse at the end of summer, as invariably from July onwards and through the autumn months dead shrews are found lying on roads and other open bare spaces; and this is not the case only here in England, but all the world over where the animal is found, in Europe, Asia, Africa and America. It is possible that the little creatures are subject to a mysterious malady which kills them in numbers in the autumn; but if this be so, one wonders why they do not die at home. I think that at this season there is a widespread migratory movement, and that many perish by the way.

The squirrel is also, I think, a would-be migrant occasionally. I have read an account of a great squirrel migration in North America, in which the animals perished in the water, like migrating lemmings in Norway, when attempting to cross a river. I have some reason to think that it is always in the autumn when squirrels first make their appearance in newly-planted woods at long distances from any place where the animal inhabits.

Rat migrations are common in England all over the country: they are regular local movements, and may not have the same cause as the seasonal migrations of birds, although they invariably occur in the spring and autumn. We know, however, that there have been great migrations of the brown rat in the past; that early in the eighteenth century it invaded Russia from China, and spread all over Europe and the world. But to go to books is to find that great migrations of mammals, big as well as little, have often occurred; that even the royal tiger is a colonist in India, and was unknown in that land when its sacred writings were composed. An account of the migration of the larger animals in Africa and North America would make a big volume.

To go back to bird migration: I trust that these observations of mine, made so many years ago, will serve to show that it would or might be well in dealing with the problem to view it in its widest aspect—to regard migration as originating in an impulse common in the animal world, from mammals to insects. From this impulse the instinct itself has been evolved and brought to a high state of perfection in some birds. Nevertheless we can see that in all cases, even in the most perfect, it is liable to derangement, so that an entire race, or even species, might be driven by it to destruction. Thus, we have seen on several occasions that the sand-grouse, which in Central Asia has a perfect migration, has gone wrong, and instead of flying north and south has rushed away west all over Europe, to perish at last in the sea.

It is not necessary to suppose that a similar disaster overtook the famous passenger pigeon and, a little later, the golden plover, Eskimo curlew, pectoral sandpiper and upland plover, since, as we have seen, the deadly war waged against the birds in North and South America during the last four or five decades sufficiently accounts for the disappearance of these species.

The fact that so highly perfected a species as Pallas's sand-grouse, in its organism, instincts and habits so admirably adapted to its peculiar environment, so hardy and abounding in vitality, should on occasions be driven away in a wrong direction, to end its flight when exhausted in lands and climates unsuited to it, or flying beyond Europe to perish in the sea, is enough to show that bird migration too, like that of the crazed lemmings and the insects that rush away in myriads to inevitable destruction, is a danger as well as an advantage to the bird. The reasons so far given for these great "Tartar invasions of Europe," as they were called, first in 1863 and on two subsequent occasions, are just about as convincing as any of the other migration theories I have mentioned. This is, according to Professor Newton's pronouncement on the subject, that the bird increases beyond the capacity of the country it inhabits to sustain it, for it is known to be prolific, breeding twice and even three times a year, and is also well able to escape from its enemies on account of its wariness and swift flight; that when the overpopulation reaches a certain point, the birds fly away in search of fresh pastures.

But what made them fly to Europe when all Asia was open to them to choose from? He might have taken his idea from Kirby and Spence. A better explanation is wanted, and it may be found in the fact that the impulse to migrate is occasioned by an extraneous force which is itself subject to violent permutations, which have a disordering effect on the sense.

As to my private views on the cause of migration, that is a matter of minor consequence since I am better as an observer than a thinker. It has been hinted at all through this chapter, and it has been suggested twice before by two independent observers. From the first I was led inevitably to the conclusion that the impulse was due to an extraneous force, and that the force was in all probability terrestrial magnetism. Afterwards I came upon a passage quoted from the indomitable Arctic explorer, John Rae, who found the icy North a "friendly" realm three-quarters of a century before Stefánsson. He says of the musk-ox that their north and south movements were due to a "sense of polarity." The phrase delighted me, as it expressed just what I believed to be the cause of all seasonal migration. Finally, in Professor Newton's article on *Migration* in the ninth edition of the *Encyclopædia Britannica*, I came upon the account of the naturalist Middendorf's observations on the migration of birds in Russia (1855). He found that the flight of all the migrants was towards the Taimyr Peninsula, the seat of one of the magnetic poles, and concluded that the birds were drawn in that direction or, as he strangely expressed it, were aware of that point and knew how to steer their course.

Our great ornithologist dismissed the suggestion somewhat contemptuously. In the last (the eleventh) edition of the *Encyclopædia*, for which Newton's article was re-written, Middendorf's suggestion is omitted. Nevertheless it was to me a pleasing surprise; it was a gratification to learn that this idea, which came to me in the early seventies in southern South America, had occurred independently to two other observers so far apart — one in the Arctic regions in 1845, the other in Russia ten years later.

Assuming that it is as I imagine; that there is in the brains of birds and other creatures a nerve, or nerves, sensitive to such an extraneous force, even as there are nerves sensitive to the often fatal effects of animal magnetism (sometimes called fascination) and to other extraneous forces; that it is a sense—an incipient sense or a sense in the making in some and a perfected sense in others—and is the origin of migration, which, as we see, is an irregular, erratic, and as a rule disastrous, impulse and act in insects and even in some vertebrates, while in others, in birds especially, it has developed in a manner favourable to the species, and arrived at the state of perfection we find in the swallow, the cuckoo and turtle-dove: assuming all this, and that there is something of this sensitiveness in practically all creatures endowed with nerves, may we not find some traces, however faint, of it in our own species? I am inclined to think there is a trace of it in the north-and-south position some persons find it necessary to lie in to get a proper night's rest. I had often heard of the fact, as I suppose everybody has, but it was only when I began to make a proper inquiry into it that I found how common and widespread the belief is. Experimenting first on myself, I found a slight advantage in sleeping in this position, but it was probable that "thinking made it so," and the experiment was of no value; but when I questioned others, as many as I could, I came upon facts or experiences much more definite and convincing. The instances I collected would fill a chapter, and in a majority of them the relief found in lying in this position was an accidental discovery. It will be sufficient to give three out of all the cases I have gathered.

The first I have at second hand from a friend who was acquainted with the subject and had it from him. This man (the subject) is a commercial traveller, a vigorous, healthy, commonplace person who leads a tremendously active life, continually rushing all over the country and sleeping for weeks at a stretch in a different hotel every night, in any bed he can find vacant in the house. On retiring at eleven or twelve o'clock to his room, he undresses and throws himself on to his bed, and as a rule after two or three minutes jumps up because he feels that he is not going to sleep in that position. He then throws himself about in this and that direction until he finds relief, and then getting up drags his bed's head round to the right position, and when he has got it he drops to sleep and doesn't wake till morning.

The second case is that of an acquaintance of mine, an old gentleman of eighty-seven, who has been much abroad in different countries, including many years in the tropics, in Government employment, and who is now living in retirement. He assures me that he has never had a day's illness in his life and doesn't know what a headache is. His only suffering has been from insomnia when he was a young man; eventually he found by accident that he slept remarkably well when lying in a north-and-south position, and since he made that happy discovery he has never had a restless night.

My third case is that of an old friend, a naturalist, who lives an outdoor life. He too when a young man slept badly until he found by chance that lying north and south he slept well, and has followed that rule for the rest of his life. Having a "curious mind," he speculated as to the cause and came to the conclusion that we naturally rest better when our heads are cool and our feet warm; that his rule is to lie with his head north and his feet south, because it must make a difference in the temperature with head towards the north pole and feet pointing to the torrid zone. One can't very well subscribe to his theory, seeing that, the cold and hot zones being so far apart, the difference of the earth's temperature in a space of five feet nine inches from the crown of his head to the soles of his feet can hardly be appreciable.

However, a poor theory is better than no theory, as it affords relief to the mind; and as he has now rested comfortably in it for thirty-five years, he doesn't want a new one.

Two or three years ago I was speaking on this subject to a friend who is now the rector of a country parish, but before going into the Church he was an employee of the Government of British Guiana. He said that what I told him reminded him of a curious experience he had in Guiana when it was his office to visit the Indians at various points in the interior of the country. He had Indians with him as guides, and whenever they camped at night, after putting up his hammock in the place he selected for it, near the fire, they made a great fuss over putting up their own hammocks. He wanted to know what the fuss was all about, and they made him understand that they must lie north and south in order to sleep, and trees were not always found growing in such positions as to enable them all to swing the hammocks in the way they wished. He tried to laugh them out of such a fantastic idea, as he imagined it, and asked them how they accounted for the fact that he could sleep well enough in any position. This had no effect on them; they said he "was different"; and if there were not enough trees standing north and south at convenient distances apart to hang all the hammocks those who failed to find a place would make their beds on the ground, despite the fact that these Indians hate sleeping on the ground in the forest.

He came to the conclusion that it must be a superstitious notion of theirs.

These memories of my friend put it in my mind to interrogate on the subject some of the famous travellers who have lived with or seen a good deal of savage and primitive peoples in various parts of the world. The reply has almost in all instances been that, although they had heard all about the north-and-south position as restful to many persons in the civilised world, it never occurred to them to make inquiries on the subject among savages. That, alas! is just the answer I should have had to make if the same question had been put to me. The subject was not in *my* mind when I had intercourse with the pampas Indians and the nomad Tehuelches in Patagonia.

The last letter I had was from Carl Lumholtz from America on the eve of his departure to Borneo, where he had gone with the intention of getting into the far interior of the country to make a study of that strange, elusive, shy forest people, the Punans. When with them, he says, he will bear my question in mind, and he only wishes he had had it in his mind when with the cannibals of Queensland and other primitive folk.

My reason for going fully into this matter here is the hope that the subject will be kept in mind by others who may in the future have opportunities of observing and interrogating primitive people on the subject.

Some of the most interesting of the primitive races have quite vanished, and others are vanishing—the Guanches, the remnant of the race that inhabited the lost continent of Atlantis, and the Tasmanians, and the Bushmen, perhaps the most interesting of all savages. But happily some remain—a remnant of the Bushmen, the Punans, the wild mysterious Andamanese, the little-known tribes of the Amazonian forest region, and, best of all, the pigmy races of Africa. A study of these little people—a search among the treasures concealed in the muniment rooms of their forest hovels—would probably yield a rich store of ancient documents relating to the early history of mankind.

I may mention in conclusion that the only scientific explanation of the ease some persons find in sleeping in a north-and-south position so far put forward is that it is so because of the effect of the motion of the earth revolving on its axis from west to east. This strikes me as about the craziest notion ever hatched from the brain of a scientist. For if this motion affects us, why not the other one of the earth's revolution round the sun, and that still other motion of our planetary system through space? They may all affect us, but I don't want to think of it. That way madness lies.

XIV

The pampas Indian's battle-cry—Terrifying effects of sound generally—Other aspects of sound—Effect of a powerful sneeze—The human voice at its loudest—Account of a man with a big voice—Sound in the ears of the drowning—Sound of big bells heard in a belfry—A great thunder-clap—The phenomenon and the dream—The wilderness of the mind.

TO go back to the old metaphor of the tree-climbing and exploring. When I finished with the branch or the subject I was on in Chapter VIII., which was the sense of smell in man and animals, I became aware of another subject (or branch) left behind, and this was the sense of direction, and it led to the question of migration, which was a long subject and has occupied no fewer than four chapters. Let us now return to Chapter VIII., and to the incident of the frontier tragedy with which it concludes.

There is a word more to say about that terrifying battle-cry of the pampas Indians. It has no doubt been a habit, universal in man, to go into fight with a cry, this being the natural expression of the emotions of the occasion—rage, and the hope to intimidate the enemy. Animals of the dog kind growl and gnash their teeth, and all cats yell at each other from the same motive. These savages were highly accomplished in the art, and regarded their cry as of the first importance in beginning a fight: long ages of practice had doubtless served to make it so. It was a prolonged piercing yell, more powerful and far-reaching than the best *coo-ee* of the Australian bush, and this is truly the most remarkable and effective *set* call invented by civilised man; it might well have been made in imitation of the long powerful calls of some of the big birds with great voices. And while this long cry was being emitted, the mouth was rapidly slapped by the fingers of the left hand, thus breaking it into a series of sounds; and when it was delivered by hundreds of furiously charging men, it produced an extraordinary and weird effect when first heard. Even brave men would experience a cold sensation in the spine.

The terrifying effects of sound and its place in the scheme of life, from insect to man, is, I imagine, a comparatively neglected subject, one about which an entertaining and useful volume might be written.

There are other aspects of sound I wish to write about in this place, in my own rambling, reminiscent, unsequential manner, with apologies to the reader for the coinage.

Some time ago the London newspapers contained an account of the strange sudden death of a healthy child who was playing on the carpet close to where his father was sitting in a chair reading his paper. On the father delivering himself of a powerful sneeze, the child dropped down and expired in a minute or two.

This incident served to remind me of a friend I once had in London whose sneezing performances were the most tremendous I have ever known; the whole house would be startled at his sneeze, as if a barrel of gunpowder had exploded. It also reminded me of other facts concerning these surprising little tempests or "earthquakes" the organism is subject to, and how the sneeze came to be superstitiously regarded as a sort of reminder that sudden death might fall upon us at any moment. At all events, we find the custom of exclaiming "God help you!" or some such words, when your neighbour sneezes very widespread on the earth. It was universal among the natives of South America where I was bred—I mean the Spanish natives.

One day in my boyhood I was left alone in a room with an old native landowner neighbour of ours—a big, tremendously dignified old man with a white beard, who inspired me with awe. He suddenly began sneezing, sneeze following sneeze to the number of about twenty or more, and after each one he cried, "Thank you! thank you!" Then, when the fit was over, he glared angrily at me and asked why I had kept silent. Through my not having said "Jesus help you," he might have expired! Perhaps the superstition was inherited from older non-Christian peoples.

A curious thing is that the manner of it—the character of the sneeze and the noise it produces—should differ so greatly in individuals. The animals of any species all sneeze in the same way, and it may be so with savages and primitive folk; but we have infinite variety, from the little pussy-cat puff of sound emitted by some women to the awful outbursts of noise in some men that would do credit to a mastodon or behemoth. Doubtless our civilisation, its infinite complexity, which affects the entire organism, is the cause of the variety, but as a rule each person keeps to his own individual manner of sneezing. My own sneeze shapes itself into a shrill crescendo sort of yell, probably distressing to others. "O please don't!" was my wife's invariable exclamation when she heard it, and I never succeeded in convincing her that it was quite natural and involuntary. She believed it was artificial, that I had invented or rather composed it for my own amusement.

To return to my highly explosive friend. One Sunday morning I took him and another friend to the Zoological Gardens, and in the small cats' house we met with a curious adventure. We stood for a long time watching two large ichneumons in their cage, fascinated at the sight of their swift unresting motions. For they were certainly the most restless creatures we had ever beheld: not for a second would they be still; from end to end of their large cage they would run, leaping over each other, and up against the bars at the ends, then back again.

Suddenly my friend sneezed, and the sound seemed to shake the whole small cats' house, and the effect on the two restless ichneumons was wonderful to witness. They both dropped down as if shot dead, and lay without the faintest motion or sign of life, extended limp as two stranded jelly-fish before us on the floor.

of their cage. We stared in troubled silence at them and at one another, wondering what would happen when the keeper came upon the scene.

At last I remarked that the animals had probably cost a lot of money, and someone would have to pay for them. My friend looked frightened, but made no reply. Fortunately the beasts were not really dead, although I think they had had a pretty narrow escape. By-and-by they recovered at the same moment, and jumping up and uttering the most piercing, terrified screams, they rushed away into the sleeping compartment at the back of the cage, and there buried themselves in the straw and became silent and motionless. For an hour afterwards we returned at intervals to the cage, but the ichneumons dared not venture out again.

The effect produced by the sudden loud explosive sound of a sneeze is, however, even less powerful than that of the human voice in some instances, and the death of the child who was killed by the shock of a sneeze was no great matter compared with an occurrence at a farm in the neighbourhood of my home when I was a youth.

It was a small farm near the village, owned by a native named Blas Escovar, a big, powerful man with a broad, immensely deep chest. He lived with his wife and a hired man and a black boy who assisted him in his work on the land, and as a carrier in his big ox-carts. He had a deep voice, and as a rule conversed in a low tone, because, his neighbours used to say, he was afraid of hurting you if he spoke out loud. The strange thing about it was that, though deep, it had a tremendous carrying power, so that when he let himself go and talked to his man or boy out of doors, or got into a dispute with his wife, his neighbours, a quarter of a mile or further away, would listen to his words, and on the next occasion of meeting him would ask him how the great question had been settled; had the turkey's nest been found? was the pig going to be killed on Saturday next? had they got the garlic for the sausages? and was he convinced that his wife really wanted a new dress? —and so on and so forth. This would make Blas very angry, and he would refuse to believe they had heard him from their own houses; he would say that some little spying sneak of a boy had been hiding behind the wood pile listening, and had reported what he had heard.

One day Blas was ploughing, and one of his couple of oxen refused to work properly; the beast kept turning round, kicking at and getting entangled in the traces, and Blas at length losing all patience let his voice out to its full strength in a mad yell, and the ox dropped down stone-dead in the furrow, to his amazement and dismay.

I dare say this will seem a tall story to some of my uninformed readers—too tall to be within reach of their believing capacity; nevertheless it is true, and when I related it to a scientific friend who is deep in physiology and pathology, he said that he did not doubt it for a moment, but that the cause of the bullock's sudden death was heart disease, and that the beast would have dropped down dead even if it had not been shouted at.

It may be so; but poor Blas, who had already been made to fear his own voice, was greatly troubled; for if a creature big and tough as an ox could be killed in that way, what might not happen to his nigger boy, a cunning little liar and very impudent, but who shivered like an aspen leaf when he scolded him; or to his wife when her foolishness made him angry and he shouted at her!

I knew Blas well, and he was known to everyone in the district where I belonged as the man who killed an ox by shouting at it.

This brain of mine has, I believe, registered a greater number and variety of sounds than most brains, but when I recall the tremendous or terrible sounds heard in my lifetime, I find that there are just three which stand apart and are of far greater importance than all the others.

One was when I was a boy of twelve and came near to being drowned in the Plata river: I was knocked off a rock I was standing on by another bigger boy, and sinking to the bottom, thought it was all over with me, that I should never come up again, and the roaring sound in my ears was awful and unlike any noise I had ever heard before; the sounds I had heard previously had been conveyed by means of air-vibration and not by water.

The second awful sound was one I went out of my way to hear, when I climbed into the belfry of

St. Cuthbert's Church at Wells, where there is a peal of eight big bells, so as to be at the very fountain-head of the great vibration during the ringing of the chimes. I have described the experience in another book, *Afoot in England*, and need say no more here except that it was a most fascinating as well as painful one, and that so long as I endured it I had the fear that it would make me deaf for ever or else deprive me of my senses.

My third was the most terrible of all—a strange experience, since this sound was heard when I was unconscious, in a deep sleep.

I was eighteen years old at the time, at my home on the pampas, and soundly sleeping at between one and two o'clock in the morning, when I had a terrible dream. I dreamed that I was standing on the plain, and that it was noon and a day of brilliant sunshine with a very pure blue sky. Looking up, I saw a dark object like a cloud at a vast height, but coming swiftly down towards the earth. I then perceived that it was no cloud but something solid, and as it came lower it resolved itself into iron, in bars about twice the thickness round of a hogshead, the bars being a mile or two in length. When the lowest, which were very distinctly seen, were near the earth, I could see that they extended in a stream of bars—tens of thousands or millions of bars—far up into the heavens until they faded from sight. Gazing up at this swift-coming torrent, I said: This is the end of everything; all life will be killed on earth by the shock, and the earth itself will be driven out of its orbit. Then the crash came, and I was killed or stunned, and the next thing I knew was that I was wide-awake sitting up in bed, trembling, and a sweat of terror pouring from me.

"O what an awful dream!" I thought; then the door of my room opened and my sister in her night-dress, a lighted candle in her trembling hand, stood there staring at me out of wide frightened eyes, her face white as a sheet.

"You heard it?" she said.

"Heard what?" I asked.

"Oh, why do you ask," she returned, "when you are sitting up in bed and looking like that? We are all up—the house has been struck!"

I got up and joined the others, going round from room to room and finding no sign of damage.

The wonder was when next day we found that our neighbours on all sides had had the same dreadful experience, and that in every house within a circuit of about forty miles the inmates had been roused from sleep by that awful sound and had started up, thinking that the house had been struck or that the end of the world had come.

I have never found in my reading an instance of a thunder-clap heard as in this case, as we are accustomed to hear thunder when sound and flash come together, over so wide an area. But wonderful as the phenomenon was, the dream about it interested me even more when I came to think of it. The physicist might be able to explain to us why and how that thunder-clap had had so widespread an effect, but how mysterious, inexplicable, how almost unbelievable, the manner in which it was dealt with by the mind! For the report we received from all over the district was that there had been but a single clap, and, heard by those who happened to be awake, it came with the suddenness of an explosion of gunpowder or the discharge close by of a big gun. And yet my mind, or that part of it which keeps awake, or which woke first, with inconceivable rapidity had built up a whole series of scenes and acts and sensations leading up to the shock, explaining its cause or, rather, exhibiting it in a picture.

Yet this same awful dream is one of an exceedingly common type—I dare say I have had hundreds of such. Let me give the following invention as an illustration. I receive a pin or needle prick in my hand or arm when sleeping, and a dream follows to account for it, but albeit following it at the same time leads up to it. Thus, my dream is that I am rambling in a forest on a hot summer's day and throw myself down in the shade to rest and cool myself, and while resting, and perhaps dozing, I am startled by a slight rustling sound on the dead leaves, and looking quickly round I spy a venomous serpent gliding towards me with uplifted head. It is too late for me to jump up and escape the threatened stroke; it is flashed into my mind that there is but one thing to do to save myself, though a very dangerous thing, and that is to strike first, and accordingly I make my blow at his head only to feel the sting of his poison fang in my hand; the pain wakes me. Here we see that the prick of the pin itself, the serpent's bite, is but the culmination and the last act and word in a dramatic scene which had taken some time in the acting. Yet the whole incident, with its feelings, thoughts, acts, must both begin and end with the pin prick.

There is something else in a dream of this type, just as wonderful as the inconceivable rapidity of the mind in framing its usually far-fetched and fantastic story and series of scenes to account for the sensation. This is that imagination—the creative faculty—often appears to live and function brilliantly during sleep in persons who when awake appear to be wholly without such a faculty.

But I have long been convinced that there is nothing in this dim spot which men call earth, perhaps nothing in the entire universe, more marvellous than the mind in its secret doings; also that all the wonderful things, the apparitions, visitations and revelations, new and old, the messages and tidings of strange happenings in other worlds than ours, and in other states of being, are all, all, all to be found, if properly looked for, in this same well-nigh unexplored wilderness of the mind.

XV

The rhea's voice—Sounds that carry farthest—Man and animals compared as to voice power—The swift's flight—Melody—Music as art and instinctive—Mammalian music—Capybara—*Quis*—Tuco-tuco—Singing mouse and small rodents—Monkeys—Braying of the ass as music—A purge for the mind—The ass in fable and folk-story.

WRITING of my neighbour, Blas Escovar, who killed an ox by shouting at it in his anger, I said that his voice was a very deep one. It was a deep bass when he spoke in his usual subdued conversational tone—you could well imagine that by "lifting up" that same voice the doors and windows of the house would be made to shudder in their frames — and nevertheless it had an extraordinary carrying power. An exceptional case, for we know that it is the high-pitched voices that carry farthest, and that the high clear notes of birds outrun all other vocal sounds. The rhea, or ostrich of South America, appears to be an exception among birds, like Blas with his bass voice among men.

The male rhea, like the male partridge and the males of many other polygamous species, especially in the gallinaceous order, has the habit of lifting up his voice to call his females together when they have been accidentally scattered, as when there has been a big ostrich hunt. The sounds uttered on these occasions are peculiar, for albeit they are well understood of his own people, they may be described as *inarticulate* when compared with other bird sounds, seeing that they are not *syllabled* and are formless, like the sighing and murmuring of the wind in rushes and sedges, or the hum of the insects on a still, hot summer's day in some locality where they are excessively abundant.

The rock-dove, the great bustard, the giant jabirú stork, the pinnated grouse, the capanero or bell-bird, and various other species, have the power of inflating their gullet and the bladder-like appendage attached to their heads with wind to make it a "chamber of resonance." And so with the rhea; heard at a distance, the sound produced is a low one, in character something between a suspiration and a booming. I remember that once, when riding late one afternoon in a lonely place on the pampas, I pulled up my horse again and again to listen to that mysterious noise which is like no other sound on earth. A sound that was like the thin blue summer or dry fog, which partially veils or dims and appears to pervade the entire landscape, producing the appearance of a heaven and earth mingled or interfused; a sound that was everywhere in earth and air and sky, but changing in power; at intervals loud as the summer humming of insects, then decreasing and at last so faint as to be scarcely audible, so that listening you almost came to think it an imaginary sound.

Doubtless the sound came to me from a great distance, as no male or other rhea was visible to me at the time, although when emitting its call the bird stands erect, a tall conspicuous object on the wide level plain, his long neck inflated and the pinions with their white plumes spread open. There had been an ostrich hunt that day, and the sounds I listened to probably came from two or three birds calling from widely separated points.

We note that in listening to the singing of birds the high shrill notes invariably live longest in the ears as the distance increases, while the lower guttural and harsh sounds die successively out of the performance. This is most noticeable in the skylark's torrential song, owing to the great variety of notes of different quality composing it.

The macaws in flocks, uttering their tremendous screams when flying high above the forest trees, make a great noise, but it does not carry half the distance of the bell-bird's metallic, clanging call.

I remember that in my home on the pampas, when I was a boy, we used to stand out of doors on those exceptionally still, clear mornings when all distant objects seemed near, and when all sounds appeared to travel twice as far as at ordinary times. We would listen with delight on such mornings, which were usually in the winter, to the calls and cries of the great water-fowl in three or four rush- and sedge-grown lagoons situated at different points and at various distances from our home, from something over a mile to two miles and a half. From all of them we could distinctly hear certain species: the alarm cry and song-like performances of the crested screamer; the short, rapidly reiterated call of the great blue ibis, a sound as of hammer-strokes on an anvil, only more aerial, more musical; the frenzied shrieks of the large ypecaha rail, several birds shrieking in chorus, and the prolonged sad wailing cries of the courlan, the "crazy widow" of the natives; but other big loud-voiced birds were inaudible at that distance—the scream of the great heron for example, and the trumpeting of the Coscoroba swan, their notes being without the shrill quality of the others. A human being with a voice, proportionate to his size, of the character of the bird voices I have described, would be audible seven or eight miles away in a still atmosphere. As it is, small as the big birds are compared with the big great-voiced beasts, their voices carry much farther, and the call of an ibis will outdistance the roaring of stags and lions, braying of asses and neighing of horses, bellowing of cattle, howlings of "old man" araguatos, monkeys and wolves, and screaming of hyænas.

But we, poor human creatures, the weaklings of the animal world, are surpassed in the same way in all physical powers and keenness of senses. A man with the strength of an ant or beetle would be able to place himself under a road engine, and raising it on his back, walk to the Thames Embankment, and throw it into the river.

The swifts, or devilings, have been ingeminating this mournful truth of our inferiority in my ears all day long, here where I am writing this chapter, in Penzance, in the month of June. There are eight of them; they arrived in May, and elected to spend the summer season in that portion of the sky visible from my front windows on the first and second floors of the house I inhabit. And from the time of my first peep at the sky at six or seven o'clock in the morning until I light my reading lamp at nine in the evening, they are to be seen rushing madly through the air at an average speed of about a hundred miles an hour, thus covering ten to fifteen hundred miles during those hours; but I don't know how early they begin, nor how late they leave off. And at this same rate, without resting by day, they will spend the summer, and probably the eight remaining months of the year in distant South Africa. When I look at them they are always madly chasing each other, now all close together, now in a long train, describing an immense circle, a wheel set obliquely to the earth, the long narrow scythe-shaped wings all but touching the eaves and walls above my window when they are lowest down, then off and away and up to the sky again. Then after a dozen or more times of circling, they gather in a bunch and float for a few seconds, then scatter suddenly to the four winds of heaven and vanish from sight, to reappear and re-form in a few minutes and re-start the living wheel on its everlasting rotations.

And even as the lower animals thus excel us in physical power and speed and endurance, so do they surpass us in beauty of form and colouring, grace of motion, and in melody. But as to the last point much explanation is necessary.

Music—the concord of sweet sounds—harmony—music as an art, which has been followed and perfected during thousands of years, is immeasurably above the best the lower animals have, since theirs is not an art but an instinct.

So we think and say, but it is not quite so. We see that it is not, when we find that some song birds with highly-developed vocal organs learn their songs from others—as a rule from the adults of their own species; also that they imitate and adopt notes and phrases that please them in the songs of other species. And this carried so far that in some species almost all individuals have their own original song or songs. Thus, when we speak of the "artistry of the nightingale," we are probably expressing a literal truth. But just now we are concerned only with the music of the mammalians, man included.

No doubt man, compared with many of his poor relations, is in many ways a poor creature, but his big brains, and hands to do the brains' biddings, have lifted him infinitely above them in various ways, and in none more than in music. He is at the head of the highest class of vertebrates, the highest division in the organic scale; yet, oddly enough, in music these highest (man excepted) are lowest, since even frogs and toads and grasshoppers put them to shame.

The mammalian music generally, that is to say when there is anything in the sounds emitted which can be called music, is of the most primitive type, and consists mainly of the excited cries of the beast slightly modified to serve a new purpose. The purpose, I take it, is the desire to express feelings experienced in play, in a sense of satisfaction with life, an overflowing physical happiness which must find an outlet somehow, and may show itself in mere rushings about, flinging up of heels and bellowings, as we see in cattle. These exercises undoubtedly tend to the improvement of the vocal organs and the production of sounds less harsh and savage. The sounds, then, which may be described as music in the mammals are bellowing of cattle, barking of seals, trumpeting of elephants, howling of wolves and other canine species and of monkeys, neighing of horses—wild horses occasionally burst out in a neighing chorus as if for the mere pleasure of it—and braying of asses. Large rodents have harsh voices, and the largest of all rodents, the capybara of South America, unite their voices in screaming concerts. There are, however, many small species with voices of a distinctly agreeable quality. Thus, when camping among the tall grasses of the pampas, I have listened by the hour with pleasure to the continuous flow of liquid bubbling sounds all about me of a small creature named *quis*—a species of guinea-pig.

Whether those sounds were uttered as conversation or song I don't know; there is, however, in that same region another small mammal whose voice is more song than talk. He is named tuco-tuco from sounds he emits, as we name the cuckoo from its call; and he is also known as *oculto* because he exists unseen; for though a rodent with big eyes, he has the habit of a mole, and lives in runs underground.

This wee beast takes as much pleasure in exercising his voice in a set performance as any feathered songster, although it is a voice without any musical quality. It is percussive, and is like blows of a heavy mallet on a log of hard wood, blow following blow, at first slowly, then faster and faster, and lighter, until at the end the strokes almost run into each other.

What fantastic tricks Nature plays with her creatures! It is odd enough that a rodent with big eyes, a vegetable feeder, should have been thrust underground like an earthworm-eating mole, but funnier still that it should be made a songster that amuses itself in its narrow dark subterranean habitations with those gnome-like hammerings.

If in your wanderings you come to a sandy waste, the soil in which the animal loves to dwell, you will soon discover that he takes great delight in his own performances. At intervals by day and night its sound is heard—*took-took-took*, blow following blow; and as soon as the series of sounds, its song, is finished, another takes it up, and soon all about you, far and wide, under your feet, the earth resounds with the strange hammer-song.

Here in England, we have a "singing mouse," as it is called, but although Darwin took him seriously, he is a fraud, as the sounds he emits are involuntary, and are supposed to be caused by a malformation of the breathing apparatus. A log of wood on the fire, and sometimes a poor human sufferer from bronchitis, will produce a music in the same way. The singing-mouse music has been likened to a bird-like warbling, and it does slightly resemble the shrill twittered song of some small finch, but the reader will get a better idea of it by imagining the sound produced by a manikin the size of a mouse playing on a miniature piccolo. Once only have I succeeded in hearing it properly, and that was in a house in Cornwall where the family were much troubled to hear this piccolo playing behind the wainscot, thinking it perhaps a communication from another world.

There is, however, no doubt that the vocal organ is more highly developed in the rodents, especially in some small species, than in other animals. They come nearest to the birds, and it is a wonder to me that the most bird-like of them all in its arboreal habits, swift motions and volatile mind, should be inferior in voice to many terrestrial species—the poor groundlings. One would like to hear of a singing as well as of a flying squirrel.

Unfortunately we know next to nothing of the small animals of a greater portion of the earth—Africa and Asia, let us say. From America we have heard of one musical mouse of the genus *Hesperomys*, described by a good observer, the Rev. S. Lockwood. Let us indulge the hope that in due time, in another century or so, our travelling naturalists will have finished their collecting and cataloguing and begin to pay some attention to the habits of the creatures, and to listen to the sounds they emit.

The gibbon has been described more than once as the one monkey with a musical voice as well as a song. Alas! I do not know the monkey people in a state of nature, and I must again confine myself to my proper limits—to the creatures I do know. Coming to these, I can only say that the highest musical performance in the mammalian order known to me is the bray of an ass. This is not a mere call or cry like the shrill neigh of the horse and wrathful mutterings and prolonged clear *crescendo* lowing of the bull; it is uttered by the animal for its own sake when he is in the mood, and is therefore as truly a set song as the liquid warbling of the woodlark or the *little-bit-of-bread-and-no-cheese* of the yellow-hammer. A song no doubt evolved from various ancient equine cries and calls—a resounding trumpet blast, followed by measured hee-haws, and concluding with a series of prolonged stertorous and sibilant sounds, diminishing in power till they cease. Heard in the proper surroundings, as I have heard it from the wild or semi-wild animals in a practically desert district, at a distance of half a mile, more or less, it is a notable performance that startles and fascinates the listener with its wildness and strange character.

The effect of the sound is enhanced when you catch sight of the animal, standing at ease in a group, grey amidst the tall grey-green plumed grasses, their great ears erect or pointing forward, and alarm in their faces—a noble animal, horse-shaped but with a distinction of its own, an element of strangeness in its beauty.

Fine as was the sight of these semi-feral asses, where they had a large tract of land to roam over, and vividly as the picture of them endures in memory, they were not there at their best—not as they are sometimes seen by those who traverse the vast, empty, desolate waste places of the world, where the animal is native and in perfect harmony with a barren, harsh environment. Even in such a book of travel as that of Vambéry, who saw and endured so much to satisfy an almost mystical desire and passion for an intimate personal knowledge of the fierce fanatical peoples he visited, yet who tells it all in the driest, briefest, most commonplace manner and language —even he gives you a thrill when he recounts his experiences of the wild ass.

On the second occasion of his seeing a herd he was in a town of the remote desert, when one day the wild cry that the enemy was coming was given. A cloud of dust appeared on the horizon—their dreaded enemy was on his way to destroy them! Every man rushed to get his weapons, the women snatched up their little ones from the road and fled screaming with terror into their houses, and all was panic and wild confusion; for all knew that the swift-coming cloud of dust meant a bloody fight and perhaps, to follow it, every conceivable outrage and atrocity. Meanwhile the dusty cloud rushed on, and only when close to the ramparts came to a stand, when it was seen that the raiders were wild asses. For the space of a minute or two they stood motionless, staring at the town and people who had gathered there, then tossing their heads they wheeled round and rushed back the way they came, and in a very few minutes the cloud of dust faded away on the horizon.

What was the animals' motive? Doubtless it was nothing but an impulse of play, one of those outbursts of infectious joy which occasionally seize on wild social animals, and set them off as if mad. It was as if they had said to one another: "Come, let us rejoice in our power and speed! Let us show ourselves to that fierce hunting double-beast, man-and-horse, with his spear and dagger and far-killing gun—let us stare at him in his own citadel just to mock at him and challenge him to chase us!"

To return to the subject of the braying of the ass. Incidentally the sound does (or should do) the listener a lot of good, since it purges his mind of old, false, contemptible ideas, or rather old literary conventions, which in the course of long ages have come to be articles of faith, and are so common in the language that you can't read a book or a chapter, scarcely a page, or listen to a speech or lecture or sermon, but this vile lying notion of the ass as the incarnation and type of stupidity will somehow be dragged in. Perhaps it originated in early Greece; that nasty little jeering spirit which delights to mock at and caricature the life of which we are part is not like an Eastern growth. At all events I doubt that an Arab or Chinese or Thibetan or East Indian, when he fails to hit the mark, or trips and drops something from his hand, or is forgetful, or carelessly knocks something over, instantly compares himself to a long-eared animal. How it is in other western countries than ours I don't know, but every Englishman must call himself or somebody else an ass more than once a day. If we had a law or custom which no person would seek to evade, that every time a man used the expression he should pay a fine of one pound sterling into the nearest post office, the money thus accruing to the state would go far towards paying off the National Debt before the people as a whole began to inquire into the cause of the increasing want of means; then, having ascertained it, the imbecile habit or convention would automatically come to an end.

In all literature known to me there is but one story or fable against the ass which gives me a smile; this is Tomas de Iriarte's fable of the ass who, when grazing, came upon a flute dropped by chance or forgotten in the grass. Naturally the animal approached his nose to, and sniffed curiously at it, and in doing so accidentally drew from it a beautiful sound. "Who says I am unable to make music?" cried the animal, delighted at his success. It is a "literary fable," and it is the moral—the fact that a writer's first successful book or essay or poem may be nothing but a fluke, to be followed by miserable failure or perfect barrenness—that provokes the smile; and a melancholy smile it is, since the truth in most cases may be that it was no fluke, but that the one good work came before some accident or change distuned or ruined the mind that produced it.

The Iriarte fable reminds me of a better one, one of the delightfully funny folk-stories about animals I used to hear from the gauchos of the pampas. This relates the encounter between an ass, taken by surprise when grazing among the tall grasses on the plain, and his deadly enemy the tiger, as the jaguar is called, which resulted in the triumph of the ass, purely by accident as in the case of the ass that played on the flute. The discomfited jaguar thereupon calls his friends together to give them an account of his thrilling adventure, and warns them not to meddle with that beast, seeing that despite his smaller size he is a more unconquerable and dangerous animal than the stoutest horse.

The reader must take my word for it that it is a very good story, equal to anything in *Uncle Remus* or in the folk-stories about animals from Africa and the West Indies; but as I am not writing this book in Spanish, in which language it would seem perfectly natural and innocent and would stain our purity no more than to look at a picture by Wouvermans or to walk through a farm yard, it cannot be told here.

The gaucho story is funny mainly because of the happy chance that turns the table on the aggressor; but it is known in all that level country and the adjacent Andean region, that the ass is the one beast that does not lose his head in any circumstances, however unexpected and dangerous. Thus, he (or his son the mule) when cornered or in an enclosure will save himself by a well-directed shower of blows, while the more powerful horse, gone mad with terror, will be destroyed—torn to shreds by the iron claws of the jaguar, or his neck dislocated by the puma that leaps on to his back.

Instead of regarding the ass as a type and symbol of human stupidity I regard him with affection as of my kith and kin, for a better reason than Coleridge had, since with him it was purely the Franciscan feeling of pity and love. A being with qualities that place him above all the other domesticated animals. An incarnation of patient merit. Not the hopeless, desponding patience of the conquered broken slave. A slave with a heavy burden to bear for a thousand generations, he has not lost the sense of the injustice of his lot, the power and spirit to inflict blow for blow on his taskmaster and tyrant when the occasion offers. And that's the "hoof of the ass" about which we hear so much from our intellectual, spiritual-minded, uplifting preachers and talkers and writers! Even now when writing this chapter I see in the newspapers that yet another brilliant saying of that wise man among us, the famous Dean of St. Paul's, has been caught up, and is being wafted far and wide all over the land. For wisdom is a rare and precious thing, and we value it accordingly. We have left the tiger and ape behind, he says: let us hope that by-and-by we may find it possible to drop the ass's hoof.

Original, as well as beautifully expressed! The thought is always in some people's minds, and the ape and tiger and wolf and ass are its symbols. It has been spoken every day for centuries, millions of times, in a thousand forms. I have admired the expression in one form only, by a poet and dramatist of three centuries ago; but as it is thirty or forty years since I read it I may not quote it quite correctly:

> I that spend out all my days
> And half my nights to get a wan pale face,
> Leave me! for something has come into my heart
> That must be said or sung, far and aloof,
> Safe from the wolf's black jaw and the dull ass's hoof.

It will be a sad day for our race when we have dropped the ass's hoof; the day of universal degeneracy with not a kick left in us—not a Dean of St. Paul's to tell us what he thinks of us.

XVI

Music of the lower animals—Of savage man and Hindoos—Music of the stone age—The cannibal Pan—Singing of savages—Origin of song—Diderot and Herbert Spencer—The cries of passion—Music founded on passion and play—Music older than speech—Origin of rhythm—Impassioned speech in savage and civilised man—Song in speech and speech in song—Darwin's theory—Herbert Spencer's theory of the function of music—What is Poetry?—Spiritual senses—Music and Poetry sister arts—Furthest apart at their greatest, and nearest at their lowest.

WHEN I stated in conclusion of the last chapter that the ass possessed the highest musical performance of the mammalians known to me, I was tempted to include primitive or savage man; but that would have been a hasty judgment founded on what I have heard of savage music, which is very poor, little if at all better than the musical performances of howling animals. Nor is it in savages only that we find such poor singing, seeing that in India we have a people civilised longer ago than anyone can tell us; we know at all events that they were as highly civilised in the time of Alexander the Great as they are to-day. Yet their singing is of the most primitive or barbarous kind, and offensive to European ears. Judging from the little I have heard, it resembles the singing or chanting of savages, but is less pleasing owing to some disagreeable quality in the tone—the *timbre*. We can only say then that the inhabitants of Hindustan are not musical, or that their music is not pleasing to us Europeans; or we may go further and say that music has greatly developed in the West only; that compared with European music that of Asia, for all its ancient surviving civilisations, is of little more regard to us than that of aboriginal America, Africa and Australasia. I have said in an early chapter that palæolithic man probably had teeth-gnashing musical performances; we know too that he was capable of higher things, that he had the artistic mind; we can handle the fossilised bone flute with which he "gave the soft winds a voice" not less than a thousand centuries ago. And before he made him a flute of bone he had doubtless piped on a reed in many forms for ages, and was perhaps altogether something of a cannibal Pan.

That very ancient music is lost beyond recovery: the question we are now concerned with is the origin of music, especially in man. The singing of the savages to which I have listened on the pampas and in Patagonia is a monotonous chant, not unpleasing to the ear, since the voice is often of an agreeable quality, but after a time it palls on you, and revolting against it, I have said that I would prefer to listen to the howling of canines, which is quite as tuneful, especially of the nobler species, heard in desert lands forlorn—" the wolf's long howl from Oonalaska's shore," for example. The chief point in the chanting of savages is that we recognise it as a reproduction of passionate speech, spoken or chanted without passion, employed as an amusement of the mind and slightly varied, the harsher sounds eliminated. Listening to it, anyone who has heard savages and even civilised men speaking with passion becomes convinced of the truth of Diderot's idea that the cadences used in emotional speech afford the foundation from which vocal music has been developed. I would, however, go further back than Diderot and Herbert Spencer in his brilliant exposition, and say that music in man has its origin in the emotional sounds emitted by the human and semi-human species of the Pliocene before articulate speech was invented. In other words, the root is the same in all mammals, man included. As the poet says: First the root, then the stalk; more airy thence, the leaves; and last, the bright consummate flower. We have it all in us, root to flower, and may say if we like that the lower animals (mammals) are still in the stalk stage, although some may hold that they have developed leaves. Again, in listening to the lower or more primitive music of Europe, in some of the folk-songs of all nations, especially in the ballads of the peasant Basques and in some of the more highly developed Hungarian music, one is sharply reminded of the Asiatic civilised music and the barbarous and savage music of America and Africa. The root in which it all originates is in itself a varied language, since it expresses a great variety of emotions, the war-cries expressing the fury and joy of battle with the shedding of blood; all sounds emitted by hatred and malice and revenge and anger in all degrees and shades;

apprehension—the weight on the heart—fear and desperation, and blank despair; fury and pain, and every form of misery to utter desolation; and the softer emotions, sexual and parental, love and affection, friendship and comradeship and loyalty; also the sense of the supernatural—the invisible watching eyes, the ever-following footsteps that make no sound, the evil beings that inhabit the darkness—the mystery, the amazement; and finally the strange intrusion of beneficent impulses, of tenderness, of a dawning sense of beauty, of a changed aspect in Nature, of a sense of a softened understanding mood in the Unseen, of compassion and fatherhood.

Through "inherited association" it all lives in music. Shakespeare's verse, "I am never merry when I hear sweet music," finds an echo in everyone simply because each one of us puts his private interpretation on the "sweet," which means for us music that produces a shade of melancholy—in other words, the music which touches our deeper feelings.

At the same time we know a music of a lighter character, a music which does not move us in the same way. And this too is emotional, derived from the lighter, gayer emotions of play, an instinct universal in children, and in a lesser degree continuing through life both in man and the lower animals. You may witness the effect of an appeal to children of this kind of music any day when any lively or dance tunes are played and the child's face begins to brighten and its feet and hands to move, and by-and-by, if it is not a child whose child-instincts have been suppressed from the cradle, it will break away and start dancing or whirling about. This lighter music appeals less to adults than to children, because the inherited associations of play are strongest in our early years.

We may say then that music is essentially a refined and beautiful expression of all emotions common to all men in all stages of life; that because of this origin its appeal is universal, its hold on us so powerful. Beethoven, speaking of his own music, said that those who listened to it were lifted above this earth into a higher sphere and state. It may be so: I do not know; but I do know that it takes me back; that it wears an expression which startles and holds me, that it is essentially the "Passion of the Past"—not of mine only, my own little emotional experiences, but that of the race, the inherited remembrances or associations of its passionate life, back to a period so remote that it cannot be measured by years. A dreadful past, but at so great a distance that it is like the giant terrifying mountain, the heart-breaking stony wilderness with winter everlasting for its crown, seen afar off, softened and glorified with rose and purple colour, at eventide.

Thus then, to begin at the beginning, we may say that song does not derive from speech, or not wholly from it; nor is it a twin birth with speech, but existed before it in its elemental state, and was a forerunner and prognostic of speech from the time of the marriage of sound with emotion. And this union we know exists in animals as well as in man.

The faculty or invention of speech but served to develop the original animal music to our higher music. Rhythm, which is rare in animal and is essential in human music, is an outcome of emotional speech—it comes, we may say, instinctively or automatically; it is a relief, a rest, which the impassioned speaker falls into naturally, which saves him from exhaustion, and has moreover an arresting effect on the hearers, thus adding to the power of the performance. Nor is it an aid in emotional speaking only; it extends into all sustained vocal expression; it is, as I have heard, in the crooning and murmuring sounds with which the Indian mother puts her babe to sleep; in groaning, moaning and the sobbings of poignant grief, pain and misery, and more pronounced still in the lamentations for the dead. Thus, among savages of the pampas, it is the custom when a man dies for the women of the village to mourn his loss for the space of a whole night, moving in procession round and round the hut where the corpse lies, with endless ululations; and the sounds grow rhythmical, and because of the rhythm the mourner's dreary task is lightened—if it does not become a positive pleasure.

To one who has listened to savages in their ordinary and impassioned speech and in their singing, it is interesting to note the survival of their tones in civilised speech and song. You recall the savage in listening to the impassioned speaking of a man anywhere in England; at the same time I find that in most instances when the resemblance has seemed greatest, the speaker was less Anglo-Saxon than Celtic or Iberian.

The passion inherent in all is revealed more or less in the tone according to the racial temperament. In French oratory there is a tendency to music. Thus, listening to an impassioned speech by one of their greatest speakers, the lamented Jaurès, it struck me that it was three parts cadenced speech and a fourth part recitative and song, and that it was the frantic oration of a savage chief improved in shape and colour, refined and beautified, with the long musical note to end the sentence. The savage does not end his sentences with this musical note in oratory or ordinary speaking; but in some tribes the woman does, the last word or syllable always being sung, sometimes sweetly. Here we have a transference, or an interchange of tones in two distinct forms of expression—speech and song—speech taking back from song something originally from itself and improved. And again, we have the reverse process when music falls back on recitative and even cadenced speech, as for example in Wagner's operas. As in the difference between the great French orator and the savage chief, so between the recitative in the opera and the changing and impassioned speech of the savage; in the opera the savage is still declaiming, but with an improved, a more musical voice and a higher sense of musical form.

In all that goes before it will be seen that I am in the main in complete agreement with Herbert

Spencer. To my mind he is so obviously right that it would have seemed incredible to me that anyone could fail to be convinced had it not been that Darwin had examined the theory and deliberately rejected it. He had come, he said, to an exactly opposite conclusion. Astonishing; but one can see the reason of it. He was devoted to his theory of Natural Selection; it was like a beautiful mistress to him, and the supplemental theory of Sexual Selection was her beautiful daughter, in delicate health, alas! but he did not like to hear it said so, and Herbert Spencer's theory of the origin of music was like a prophetic unfavourable diagnosis, and he would not have it, and even went so far, when rejecting it, as to make a little fun of it.

"I conclude," he says, "that musical notes and rhythm were first acquired by the male or female progenitors of mankind for the sake of charming the opposite sex. Thus musical tones became frequently associated with some of the strongest passions an animal is capable of feeling, and are consequently used instinctively, or through association when strong emotions are expressed in speech. Mr. Spencer does not offer any explanation, nor can I, why high and deep tones should be expressive, both with man and the lower animals, of certain emotions."

The very simple explanation is that the high and deep notes are expressive of the strongest passions, and are the root sounds of music in its intensest moods and state.

He also says: "But if it be further asked why musical tones in a certain order and rhythm give man and other animals pleasure, we can no more give the reason than for the pleasantness of certain tastes and smells."

It is on the contrary very easy to give the reason, since it lies on the very surface. What we find good for us, what makes us feel comfortable and happy inside, when it has been absorbed, is good to smell and taste, and, I may add, to see, so that even an object ugly in itself—a roast goose for example—not only smells nice, but looks beautiful if we are hungry.

And he says too: "As neither the enjoyment nor the capacity of producing musical notes are faculties of the least use to man, in reference to his daily habits and life, they must be ranked among the most mysterious with which he is endowed."

How the faculty and capacity came about we have seen plainly enough, and as to their uselessness they are no doubt just as useless as many other faculties and capacities which are a part of us, and are not concerned with food-getting and so on, and, we may add, just as useful from another point of view. As useless (and as useful) as the instinct of play for example, of running and leaping and climbing and paddling and swimming and diving, and of basking in the sun, and rolling on the grass, and shouting when there's nothing to shout about. Or, let us say, of the sensation of well-being, of contentment with life, of overflowing gladness and the actions and sounds that express it. What then is the precise meaning of "mystery" in this instance? In a sense everything is a mystery—our existence, for example, a universe without beginning or end, and everything in it from an atom, an electron, to a sun. We are conscious of even greater mysteries than these when the vast unbounded prospect lies before us, and they appear to us as the clouds and shadows that rest upon it. When a great scientist encounters a difficulty, one of the ten thousand problems that lie all about us challenging our attention, and after glancing at it drops the word "mystery," and passes it by, one would like to know if it is said to discourage those who come after him, as a warning that they will only break themselves against it. One can only conclude that the word used in this way, without explanation, is a stumbling-block and a nuisance in a scientific work.

To go back to Darwin's argument, he further says:

> Women are generally thought to possess sweeter voices than men, and as far as this serves as any guide, we may infer that they first acquired musical powers in order to attract the other sex. But if so, this must have occurred a long time ago, before our ancestors had become sufficiently human to treat and value their women merely as useful slaves. The impassioned orator, bard or musician, when with his varied tones and cadences he excites the strongest emotions in his hearers, little suspects that he uses the same means by which his half-human ancestors long ago roused each other's ardent passions during their courtship and rivalry.

It is a passage one is sorry to read, because it was writ by Darwin and—it is ridiculous: not the ironic sentence in the middle only, but the whole of it. In the lower animals love and courtship is an excitement which occurs once a year or at long intervals; it lasts but a short time, and when it passes, other excitements, in some instances just as violent, resume their sway. And primitive men are really nearer to the lower animals in this respect than to civilised man. Love is a somewhat sudden passion, or rage, in them, and the passion of courtship is apt to be a brief one and somewhat violent. There was never a time in the early history of the human species when the female courted the male and invented song to attract him.

I fancy that when a modern philosopher suggested that the æsthetic sense, the sense of beauty in all things, is but an overflow of the sexual feeling, he was not spinning it all out of his own brain, but had taken the sexual selection theory at Darwin's own valuation, and made the sex feeling *the* root instead of making it one of the many distinct elements contained in the root.

The scientific mind in its questing after the truth reminds one of the stoat on the track of its quarry. Swift and elusive the quarry may be, besides having had a good start, but nothing will serve to turn aside or dishearten his pursuer, who follows steadily, patiently, without haste and without rest, with a deadly resolution and staying power which at last gets its reward. The difference is that the stoat makes no mistakes, and the seeker after truth makes many. And that is how it was with Herbert Spencer, when, after working out his theory of the origin of music to a triumphant conclusion, he set himself to find out and expound the function of music. On this second quest he goes off in the same temper, the same cold, deadly zeal, as on the first, and in the same way brings it to a victorious conclusion. Yet it was an imaginary scent he was following all the time, and an illusionary rabbit in which he set his teeth, and whose imagined heart he drains of blood to its last drop. There was no rabbit because there is no function. A function, as we all understand the word and as it is defined in the *Oxford Dictionary*, is "the special kind of activity proper to anything: the mode of action by which it fulfils its purpose." Thus, the function — the use, the purpose — and thing — organ or what not—are one and indivisible as in the eye and seeing, the ear and hearing, the wings and flying, and so on. Undoubtedly the word is sometimes used in a somewhat different or a more extended sense, and is made to mean the use or purpose which a thing may acquire, and in such cases what is called a function may be one of several functions. But Herbert Spencer does not use the word in this sense when he writes of *the* function he thinks he has discovered, which, as it happens, is not even *a* function of music.

To give the gist of the matter contained in a great many pages of argument, he contends that the cultivation of music must really have *some* effect on the mind, and this being so, what more natural than to suppose this to be the developing our perceptions of the meanings of inflections of voice and giving us a correspondingly increased power of using them. Or, to put it in seven words: music reacts on and improves our speech.

Here we have Herbert Spencer at his worst, even as we had him at his best a little while ago. He might have found a dozen functions for music, and not one further off the truth than this. It is, in fact, a reversal of the truth—a putting the cart before the horse. To begin with, what he calls *music* is only the lesser half of it, since it does not include instrumental music. Furthermore, vocal music is comparatively non-progressive—necessarily so, seeing that it is only concerned with certain aspects of life. Whereas speech progresses eternally, being concerned with all life, and if there is any progress at all in vocal music, it is due to the influence of speech. Singing is a recreation indulged in occasionally or at long intervals, and not by all. Where it is very common, it is little more than the monotonous chant of savages; and as we go higher we find it less and less common in civilised peoples; but speaking is continual and used by everyone from infancy to death—this being the only incident which can stop the tongue from wagging. And the result of thousands of years and thousands of centuries of practice has given it so marvellous a flexibility and variety, which includes every emotion in every degree and shade and shadow of a shade, that you will get more tones and inflections and modulations in half-an-hour's talk from any bright-minded voluble child of fourteen than from all the singing you have heard in a life-time.

It would be idle to labour the point further; the light of nature is enough to show to anyone the falsity and the absurdity of Herbert Spencer's theory of what he magnificently calls *the function of music.* Here let me say that after this chapter had been written I came by chance on Wallaschek's *Primitive Music*, a neglected and perhaps a forgotten book, to find that he has anticipated some of my criticisms of Darwin's and Spencer's theories, but about Spencer's theory concerning the function of music he has nothing to say. Something, however, must be said as to the other point already touched on concerning the extended meaning sometimes given to the word. Let us suppose that Herbert Spencer, instead of being helplessly wrong, was right about the improvement of speech through song; this would not have been *the* function of music, but merely an accidental benefit or use which had come in course of time, one of numberless such chance or accidental uses we get from other faculties and arts, which may endure and which may come like shadows, and so depart in the long life of the race, but are not functions proper to their faculties or arts.

What, for example, is the function of painting? Religious, historical, decorative—anything you like; or you may say that it is to provide wealthy persons with beautiful pictures in heavy gilt frames for the decoration of their houses; or, better still, that it is for the elevation of the lower orders at the East End of London by means of exhibitions.

These and all the other chance or incidental functions you may find or imagine would not be *the* function of painting, and if you seek for that you will not find it, because no such thing exists. And if this should seem a bold thing to say, I would ask what is the function of a soul growth?—of faith, hope and charity, reverence—in one word, spirituality; of the sense of beauty, the love of humanity, altruism, the aspiration towards a lovelier, higher, better state:

> The desire of the moth for the star,
> Of the night for the morrow;
> The devotion to something afar,
> From the sphere of our sorrow.

"The light that never was on sea or land; the consecration and the poet's dream."

And what, by the way, is the function of poetry? Let us inquire first what is poetry, and then we shall perhaps know. Wordsworth said it was "emotion recollected in tranquillity," the most famous definition yet given, but it was wrong and would have been right if he had said it of music, seeing that poetry is thought, imagination and emotion, whereas music is wholly emotion—emotion recollected in tranquillity—passion purified from pain, sublimated, beautified, glorified, but always passion, passion, passion and nothing else.

Shelley said it was "something divine," which may be said, and has been said, of so many things that it was not worth saying of poetry. Carlyle called it "musical thought," a saying which in its essence is a platitude. Santayana says it is "speech for its own sake and sweetness," which is a good deal less than half the truth. Matthew Arnold called it a "criticism of life," which is just what one would expect Matthew Arnold would call it; and Dr. Johnson said it was the "essence of common sense," which is also precisely what one would expect Dr. Johnson would say. Better still was Sir Isaac Newton's definition of poetry as an "ingenious sort of nonsense." I remember that my father was accustomed to say that poetry was the one thing he could not understand. But he did not, like the great Newton, put the blame on poetry. A humble-minded man, he owned that it was a defect in himself, a blind spot which prevented him from seeing what others could see. Best of all is the anonymous author of *The Faculty of Language* (1831), who held that poetry originates in a defect of the mind—its inability to express what it means in literal language.

Has this inquiry then brought us no nearer to the understanding of what poetry really is, to say nothing of its function? No and Yes. No; but it was worth making, since it has incidentally given us a good laugh at the wisdom of our wisest, who, in trying to define poetry, succeed only in defining themselves. Yes; because, when we have taken all these several pronouncements, and about forty more which any "industrious fly" may gather from the books, and mixed and vigorously stirred them up together, like the various ingredients of a plum-pudding, we discover in the process and by tasting the mixture that poetry is just what it is to you and to me and to each and everyone who likes it; or, in other words, that we receive but what we give.

Here the reader will perhaps remark mentally that I am going beyond my last, seeing that this book professes to be about the senses of animals, man included. It is: and I take it that our senses of beauty, wonder, reverence, of right and wrong, and so on, are senses in the literal and restricted sense of the word—senses, with their special organs, their specialised nerves, that vibrate in response to special stimuli, even as the other senses respond to stimuli of another order, such as the sense of direction, of polarity, of telepathy, of earth, air and water, and many others we recognise vaguely or only surmise.

Nor can anyone ever say that these higher faculties and qualities of mind are developed exclusively in the human brain. The more the psychologists dig down to get at the roots of these faculties, the deeper they find them—deeper far than the lowest level of the human brain. What we call spirituality is not ours by miracle; it was inherent in us from the beginning: the seed germinated and the roots and early leaves were formed before man, as man, existed, and are ours by inheritance. It grows and flourishes side by side with reason, but does not flourish in the same degree. This plant, which is to us the most beautiful of all that the mind produces, is like a frail herbaceous plant growing in the shelter and protection of a tough thorny shrub; and this same shrub which enables it to exist, which safeguards it from outside assaults, yet deprives it of sunlight and rain, so that often enough it seems to us but a sickly and seldom-flowering plant. That is how it is in man. To see and recognise it for what it is in the lower animals it is necessary to live with and observe them closely and sympathetically. Little by little the knowledge comes that, notwithstanding the enormous difference between man and animals, mentally it is one of degree only, that all that is in our minds is also in theirs.

Here I could insert a very full chapter giving instances of a sense of beauty and humour, of conscience and altruism, in animals, drawn wholly from my own observation and experience, but there would be no room in the book for it, and we have not yet finished with the subject of music. And first in conclusion of this chapter I will go back to the question of music and poetry.

What is their relationship? They are to my mind the only sister arts, though it may seem at first sight that they are not more nearly related to each other than to the other arts.

They are two distinct beings, both beautiful beyond all others, but differing in feature, expression, voice, personality. Nevertheless, they were born of one mother, thousands and thousands of generations ago; they were cradled in a cave, nourished at the same savage breasts, and slept on their bed of dry leaves with their arms twined about each other. When, as children, they played in the sun the entire tribe was drawn together to witness their gambols, their marvellous grace and swiftness, and listen to their shrill beautiful voices, and were so carried away at the sight and sound that they laughed and wept and shouted their applause. But as they grew to womanhood they changed, and progressing from beauty to beauty, they yet grew less and less alike until, their sisterhood forgotten, they were become strangers to one another and drew further and further apart; and finally, each on her own throne, crowned a queen and goddess, and worshipped by innumerable devoted subjects, they dwell in widely-separated kingdoms.

Now to drop allegory and metaphor and come back to downright "literal language," which even the blind spot in the mind can prevent no one from understanding.

Milton was mistaken when he spoke or sung of "music married to immortal verse," seeing that immortal verse means great poetry and great poetry is great of itself; its greatness is lessened if not degraded by union with another art, however lustrous that art may be. In the same way music at its greatest is independent of poetry. When great music is built on a story, as in opera and oratorio, the words, although rhetorical, are not poetry. If they were, the poetry would go unheeded. It has no effect as poetry. If there were anything one could call poetry in such an opera, let us say, as *Tristan and Isolde* and I gave my attention to it, the opera, as music, would be spoilt for me, seeing that the music means so much more than the story.

Poetry and music, we may then say, are furthest apart when at their greatest; nevertheless their relationship is sometimes suggested in great poetry, though never in music. This is only in poetry in which the thought, however lofty, is felt and expressed with passion—when thought and passion are welded into one. Thus, in Shelley's *Hymn to Intellectual Beauty* and his *Ode to the West Wind* there is a great thought, but it has fused in the heat of the poet's passion and made one with the passion, and is like a flame within a flame.

A most perfect example from the older poets is Vaughan's *They are all gone into a world of light.* Some of Keats's poems also produce the effect of music, albeit the passion is less than in Shelley or Vaughan. One may also find it in Swinburne's *Itylus.* Byron has one lyric which might be included in this category—*O snatched away in beauty's bloom.* Two or three of Cowper's shorter poems and two or three lyrics by Blake have this quality; it also appears in a few of Emily Brontë's somewhat crude verses such as *The Linnet in the rocky dell*, and one or two others. One may be found even in E. B. Browning — the only one I can re-read — the message to Camoens in his absence from his dying wife. There are far more perfect examples in Edgar Allan Poe, in *Ulalume*, *For Annie* and *Annabel Lee* for example. Also two or three lyrics in Tennyson, the best being *Tears, idle tears*, and *Crossing the Bar.*

It seems incredible that any of these poems, and others which produce a like effect, should have tempted any composer to "set the words to music."

He who would do such a thing, however eminent in his own art of music, is ignorant of the meaning of poetry at its best. That which is perfect is perfect and cannot be bettered. You cannot improve a statue of Phidias by dressing it in silks and embroidery.

This same effect of great music is produced by some passages in blank verse, such as that one in *Paradise Lost* which makes the sublime dream of heaven and earth less to us than the poet's own heart-cry—the revelation of a secret bitterness when he laments his blindness. There are also passages that stir us like great and solemn music in Keats and Wordsworth, and in Thomson's *Seasons*, though the Georgians will snort at my saying it. I go even lower and find a passage in Akenside's *Pleasures*, which are nothing but pains to most modern readers. There is also a passage in so inferior a poet as Alexander Smith which lives in my memory like great music.

In prose, too, there are such passages, and one cannot but recall the English Opium-Eater's awful dream with its unforgettable conclusion—its reverberated everlasting farewells, from which the dreamer awoke to cry out aloud, "I will sleep no more!"

To return to the starting-point: when the two distinct supreme arts of poetry and music do actually meet and become one, is when both (as arts) are at their lowest, when the music is nearest to primitive music, and the poetry is the lowliest, the simplest, the nearest to emotional speech. It is only then (to resume the allegory) that these two queenly ones, remembering their past sisterhood, put off their crowns and purple, and, arrayed meanly, steal forth to meet again in some desert place on the remote borders of their respective kingdoms, to be to each other as in the ancient days when they played together in the sun, and slept twined in one another's arms in a cave, on a bed of dry leaves.

It is in the folk-songs and early ballads, of which the tunes as well as words have survived, that we find this union of music and poetry. That period passed away before the ages of a higher culture and of the "perfect lyric," the witty, polished, intensely artificial poetry in which the simple natural emotions, common to all humanity, had little or no part. In the eighteenth century the Scotch peasant poet of genius brought us back to nature and passion in his songs in which his words were fitted to the old surviving melodies he found. Others followed, and perhaps the most perfect example of that or any time in our history of the union of words and music is found in the ballad of *Auld Robin Gray*. At all events, we feel that after a century and a half it has not yet lost its virtue.

The reason of this vitality is not merely that the story has a universal appeal—a thousand as good have been told in verse—but mainly because the words and the tune are so admirably fitted. All the emotions described—the love, the weary waiting, the abandonment of hope, the enduring grief and sad resignation—are jointly and equally expressed by both: they are described in the words and echoed in the tune with its wailing notes which simulate the very sounds in which such emotions spontaneously, instinctively, express themselves.

Perhaps the only song of the nineteenth century to be mentioned in the same breath with *Auld Robin Gray* is *Swanee River*, which has now been banished, but will no doubt return by-and-by, to sound in the ears of all people that on earth do dwell for a second period of sixty-five years, unless the poets and composers of the twentieth century should succeed, in the meantime, in giving us something better.

I don't know enough to say positively whether or not such perfect examples are as rare as I imagine them to be. Every reader will probably recall some song which, for *him*, has this character, and if not sure about it, owing to the tricks association plays on all our minds in such matters, he can compare notes with others. But he will do well not to go to musical composers and performers for an opinion on such a subject. They are bad judges, simply because they can't escape the distorting reflex effect on the mind of a life vocation. Music comes first with the musician; when music and poetry are joined, the former must be the predominant partner. Nor can I say whether or not more examples are to be found in the songs of other nations than in our own. I have heard only one Italian song and two of the old Spanish songs of love and grief, in a minor key, which seemed to me perfect in the union of words and music; only, in all of these three the poetry is less simple, less near to emotional speech, than in our best examples.

The most perfect example I have heard, in any language, was a Breton folk-song: and here again, as in *Auld Robin Gray*, we go back to the early stages of art, and are nearest to the primitive. The singer was a Breton peasant, an immigrant in South America who had drifted out to the Argentine frontier and was a hired hand of a brother of mine at his ranch in the wilderness. He was a young man with a good voice, and the song is the lament of a young girl in a decline who knows that her life must shortly end. She is standing among the trees on a sunny autumn day watching the yellow leaves fluttering in the wind and falling all around her. It is her good-bye to nature and her life on earth, for she will no more see the yellowing leaves in the autumn nor spring when it returns to earth with bud and flower and the songs of birds. And here, as in *Auld Robin Gray*, the melody and all the words express are one; but it is better, since the passion is plangent and the melody varies with the feeling, until, at its height, it is a cry of exquisite anguish at the thought of all the sweetness and beauty of life so quickly lost, then sinks again to sadness, to mournful resignation and a vague hope.

This little song of a peasant haunted my mind for days; nevertheless, I could not have said that it was good of its kind, being mistrustful of my judgment in such matters, had it not been that my brother, who was a lover of music, with a knowledge of it which I have never possessed, was affected in the same way. It haunted his mind as it haunted mine.

It remains to ask if this perfect union of music and poetry is ever found in the higher stages of these arts. We have seen that music is not, and cannot, legitimately, be married to immortal verse; but the union is possible, and perhaps frequent, between great music and the simple poetry that is nearest to emotional speech. I recall King's *Eve's Lamentation* as a good example, and it occurs to me after speaking of this folk-song, because the lament in both instances is inspired by a similar feeling. The words, the poetry, set to the great music are simple enough—"Must I leave thee, Paradise!"—and that cry of the heart is in both words and music, and is ingeminated, and grows, until, in the last abandonment of grief, it rises to the final heart-broken and heart-piercing note.

The theme is the same—the everlasting farewell to Paradise in one case, and to earth and life in the other—and the difference is that between an art in its early undeveloped stage, and in its full development. One, nearer to the common earth in the close resemblance of the notes to the very sounds of lament with tears; the other, with the same sounds cleansed of their earthiness—sublimated, glorified, by a great art.

XVII

Instrumental music, one with vocal music in its origin—Instrumental music in the lower animals—Insects—Cicada—Locusts—*Œcanthus*; silence, moonlight and tears made audible—*Locusta viridissima* and music in insects and man—A robber fly's musical performance—Of insect wing-music generally—Hover-fly—Birds as instrumentalists—Storks and woodpeckers—Wings as instruments of music—Wing slappings and clappings—Bleating of snipe—Origin of wing-music.

THE second part of the last chapter was not a digression, although, in considering the relation between music and poetry, we seemed to have got quite away from our own relationship with the lower animals; but no sooner do we come to the subject of instrumental music than we find ourselves once more mixed up with them. And this, to my thinking, is, in our species, the better half of music.

In birds, owing to their soft feathery covering and to their hands and arms being lost in their wings, music is mainly from the throat: so it is with the batrachians that blow themselves out like bladders to get them "a chamber of resonance" to pour out their souls in vocal sounds. Here in England with our two modest frogs and a pair of toads, we know little of the power of voice in that order of beings and the pure musical sounds emitted by some species.

Insect music, on the other hand, is almost wholly instrumental and would be entirely so but for the fact that in some species the sounds are produced not solely by means of drums and bow and string apparatus on the exterior of their scaly segmented body-casings, but partly from the interior of their bodies.

The two forms of music—vocal and instrumental—are one and the same in their origin, born simultaneously of the same impulse, consequently Herbert Spencer is wrong in saying that all music is vocal in its origin. In both, it is sound produced voluntarily for its own sake—a sound or sounds originally produced for another purpose (sounds with special functions), eventually produced in a modified form solely for pleasure.

Thus, in instrumental music, it may be a call, like that of the woodpecker when he drums on a tree; or of the *Anobium* beetle, called death-watch, when he makes his measured strokes on wood; or of the rabbit thumping, a sound which, in that creature, has kept its original purpose and is used for no other. But in the vizcacha, the large burrowing rodent of the Argentine plains, the thumping has developed into a performance practised for its own sake—a sort of eccentric dance with an accompaniment of rapid thumpings or drummings on the hard earth with the powerful hind feet.

Such sounds, then, produced solely for their own sake, for pleasure, are the beginnings of instrumental music in both men and the lower animals. In mammals and birds such sounds are as a rule accompanied by vocal sounds, but not in the insects that have their tracheæ in their sides. On the other hand they have a horny case or covering, in segments, with more or less horny wings which produce sound when vibrated; thus they get sound from the surface of their own bodies by means of friction of part against part, so that, except in a few cases, it is purely instrumental. And as the sound is produced voluntarily for its own sake it is their music.

We see, too, that its practice during millions of generations has led to an infinite number of modifications in the structure of wings, legs and segments in the hard covering; that in many kinds it has brought about a complex stridulating apparatus; that wings and legs have become studded with horny processes and are used just as the violinist uses his bow to strike upon and draw across the embossed veinings, which serve the purpose of strings. In this way the music of the orthopterous insects and in other orders is produced. Even the small ants, which we know are a wise people, have their æsthetic sense and have developed a stridulating instrument; albeit the sounds they draw from it for their own pleasure are inaudible to us.

In some insects the modification of structure has been carried much further, as in the cicada in which the entire body has become a marvellously elaborate instrument of sound. A flat insect no bigger than your thumb-nail can make himself heard a quarter of a mile away, and often considerably further—think of it! With a voice like that, proportioned to his size, a man in Kent could start singing and bring thousands of people in France running out of their houses to listen to him.

As the entire body of this insect, inside and outside, has been converted into an instrument of sound, with its drums and air chambers, we can say of it that its music is both instrumental and vocal, albeit without a vocal apparatus.

The loudness and shrillness of the sound, like an electric bell of tremendous power, or the sound of sawing through an iron bar, was distressing to the listener in the species I knew in South America; like many others, I wondered how the ancient Greeks could have taken delight in the music of their *tettix*. I discovered later, not from the books but from my own observation, that there are cicadas and cicadas, that some species are capable of pleasing sounds; and this knowledge, oddly enough, came to me when listening to the *Cicada anglica*, the one and only species we have in this country. The "song" of this insect has been a debated question during the last hundred years or more, many entomologists holding that it makes no sound at all: at present it seems that I am the only naturalist in England who has heard it, and could give an account of it, which I have no space to do now, but will only say that it is a soft and a pleasing sound, and is more like the music of a leaf-locust than of a cicada. If the cicada of old Greece made as pleasing a sound as our British species their partiality for it was not strange.

To come back to the orthopterous insects and their purely instrumental music. It has been said that it can give us pleasure solely because of its associations. This we can understand in the case of the "cricket on the hearth"; also of the field cricket when we remember Gilbert White's words: "Thus the shrilling of the field cricket, though sharp and stridulous, yet marvellously delights some hearers, filling their minds with a train of summer ideas of everything that is rural, verdurous and joyous."

Into this question we need not go, but I am convinced that there are many insects in this order that delight us with the intrinsic beauty of the sounds they emit. They are few in this country, and owing to their extremely local distribution they are not generally known; the best among them is perhaps the large green grasshopper, *Locusta viridissima*, which can have no associations for most of us, yet the silvery shrillness of its sustained notes is pleasing to everyone. This home insect, however, cannot compare in its music with many exotic species. Of those known to me I will mention only one—a leaf-locust of the genus *Œcanthus*, found throughout North and South America.

It is a slender, frail-looking insect, all of it, wings included, of a pale, delicate green, the whole body like the wings looking almost semi-transparent. By day it lies concealed in the clustered foliage of trees and sings after dark and appears to be most tuneful on moonlight nights. It has a sustained note, repeated several times with silent intervals of a second or less; then a longer interval of silence and the strain once more. It is a soft and silvery sound, and differs also from the music of other locusts and crickets in its *slowness*. For the locust sound is not one, but a series of sounds following so rapidly that they blend into one sustained chord of sound; whereas in this insect the points or drops of sound are heard distinctly as separate notes. Several American writers have tried to describe it; thus Thoreau called it "slumberous breathing," and Hawthorne more successfully describes it as "audible silence," and adds: "If moonlight could be heard it would sound like that."

This is good, except that it omits a quality of the sound which is its principal charm—its *expression*. That is, its tenderness, a quality which we find in some bird music—our willow wren is an example—but do not find in other insect music. It is the most melancholy of all delicate sounds in nature; and because of its slow sadness and musicalness you might imagine it to be a human sound, although not a vocal one. Let us say, of a once human wood-haunting solitary minstrel, now faded and dwindled away to an almost unsubstantial entity, who no longer walks the earth but dwells in trees where he has taken the colour and semi-transparence of the leaves he lives with; that at night time, when the moon sheds a misty silveriness on the dusky foliage, he wakes once more to memories of long-dead human affections, and with moth-like fingers sweeps the strings, drawing out those soft, low, yet clear penetrative sounds that make the silence deeper, and float down to us like the sound of tears.

So far we have only considered insect music of the highest kind in which sound is not only produced for its own sake, but is actually drawn from elaborate musical instruments made for this sole purpose; made or evolved, in any case a modification of the sound-producing parts of the organism in response to a want and a desire in the creature's life. This in man is what we call a desire to express himself—to express something in him which is not solely, or not at all, concerned with purely material needs; and as a result of this desire we have singing, and playing on musical instruments; also dancing, picture-painting and moulding or chiselling forms in imitation of natural objects in clay, or wax, or stone, and various other arts. The desire, the impulse, the instinct, is one and the same in man and insect. To the musical and the artistic minded generally, this may seem an unpleasant idea, a degradation of art to something low and little. To the naturalist there is nothing low and little in this sense. But we know that the fact of evolution in the organic world was repellent to us for the same reason—because we did not like to believe that we had been fashioned, mentally and physically, out of the same clay as the lower animals.

When our great green grasshopper, *Locusta viridissima*, as described by me in another book, sings to please himself and incidentally pleases the listening female, he is so absorbed in his own performance that he disregards her even when she follows him and casts herself in his way. His musical passion overrules all others. His attention is drawn away to some other locust far from sight in some distant place and insolently returning song for song; and forthwith he sets out to find him, hidden somewhere in that thorny wilderness; and after much labour having found him these two sing against one another, and alternatively sing and listen, and listen and sing; then rush together, whereupon each strives to tear the sounding instrument from his opponent's back to silence him for ever, or, if possible, to kill him outright.

We see, then, that this insect is moved by an artistic passion similar to man's, only more powerful, and as sounds have a different value to him owing to the difference in the senses, we can believe that his shrill music gives him a greater delight than we receive from our best performances.

From the highest kinds of insect music let us now go to the lowest—the humming sounds. These sounds are ordinarily supposed to be produced solely by the vibration of the wings in flight and are wholly involuntary. I was feelingly persuaded that this was not so, when, during my early life, I used to go out to the bee-hives, and removing a side from a hive would proceed to cut out honeycombs for the breakfast table. I invariably knew just which one of a dozen or twenty bees flying around would sting me from its strident humming, so different from the soft, scarcely audible hum of the others; and no sooner would I know it than the bee would be on me burying his sting in my cheek. I also observed that when a long-legged house spider captured a fly and enveloped it in a shroud-like webbing, the shrill outcry of the fly was ten times louder than the sound he made when flying. Again, when a bumble bee entered the bell of a flower to find a sweet store in its nectary, he emitted a shrill sustained sound while drinking it without any movement of the wings. The sound expressed its pleasure and doubtless the pleasure was all the greater for the sound.

Much has been written on the anatomy of the fly with regard to its sound-producing mechanism, and it is known that the sound is partly produced by the vibrations of the wings and partly by other means, also that it can be varied at will. Authorities differ as to the exact process, but we are not concerned with these details.

The leaf-locust, *Œcanthus*, has been described as an example of the best kind of music in the most musical insect order. Let me now describe the highest performance known to me in the lower kind of music the fly and other humming insects are capable of.

One of the most notable families in the Dipterous or Fly Order is the Asilidæ, our common Robber Flies; large rapacious flies that have a world-wide distribution and vary greatly in form, size and colouring. In the typical genus they are of a crane-fly grey in colour with long hairy legs and under parts. The fly to be described is of this genus, but I am in doubt as to the species, which is either *Asilus rufiventris* or a species closely allied. It is one of the commonest robber flies in Argentina and its habits are similar to those of the order generally. Thus, it places itself with head up, in a vertical position on a stem or blade of grass in an open place where it can watch for insects passing overhead. When an insect, not a wasp or bee, though it sometimes makes a mistake, comes flying by, it darts swiftly up as if shot from a tube and, clasping its victim with its long spiny legs, brings it to the ground and there struggles with it, prodding it in the softer parts with its proboscis until it is dead. Its ordinary flight is silent, or the humming sound is so low as to be scarcely audible. When the male catches sight of a female seated on a stem he flies to her and balances himself motionless in the air about three inches from and on a level with her. He then emits a clear sustained humming sound, and after some seconds changes the key to a higher, shriller note; and presently this again changes to a still higher note, so sharp and fine that it is most like the piping of a large species of mosquito. After these three notes the highest and brightest is succeeded by a buzzing sound, like that of a buzzing wasp, but not prolonged, and it comes like measured strokes—buzz, buzz, buzz, and at each repetition the fly drops down a space of about two inches, and at the same time throws out and oars his legs, then rises to the former level; then after this note has been repeated a dozen or more times, again the deeper sustained hum, and all the changes.

It is all a musical performance, and the only motive one can see or divine is simply the pleasure it gives to the performer; for after it has lasted a long time he flies away, or she flies off and leaves him. But though it ends in nothing, and she sits immobile through most of it, it is evident that it also affords her some pleasure to hear it, since at intervals, especially during the highest and brightest note, she responds, beating time, as it were, with a measured buzz, buzz, buzz, and at each repetition of the sound throwing her wings out at right angles to her upright body. I have watched and listened to this performance hundreds of times since my childhood without losing interest in it. It is the only humming and dancing performance in insects known to me which may be described as a set artistic one and on a par with bird performances of a similar character. But I believe that all dipterous insects, albeit they have not evolved any such set performances, yet in their freer way do find the chief pleasure of their brief lives in aerial exercises with the accompaniment of music. Flies, we are informed by the authorities, have three different tones in humming when on the wing. I believe that if we had a sense of hearing capable of catching the finer tones we could say that they had many more than three; that if by means of some invention the sound of a cloud of midges or gnats or of house-flies in a room, perpetually revolving in their aerial dances, could be fully conveyed to our sense, it would be a tangle of an infinite number of individual sounds as varied as the concert singing of a multitude of linnets or starlings. On any hot summer's day in the open country you hear a loud continuous hum from aloft; it is the sound of tens of thousands of individual sounds of insects flying high in the air all fused into one sound, resembling the hum of a distant threshing machine. They spend their days in these exercises; it is their happiness—music and motion combined. Incidentally, it leads to pairing just as our own ball-room exercises often lead to marriage.

One of the commonest flies in the world, found all over the world, is the hover-fly; the species of its family in this country alone runs into hundreds, consequently it should be familiar to everyone and admired above all flies. Bee-shaped, but brighter in colour, it is often mistaken by the dull myopic vision of those who are not naturalists for a bee or wasp with a sting. It is to a honey-bee at his slow pollen-gathering work as a fairy to a sweating harvester. So active and swift is it, there is no other creature to compare with it—not the swift itself, nor the humming-bird, swiftest of all birds. It is more like a meteor than any organic thing, or an electron, magnified and vitalised. Of all the myriads of organic forms thrown off like a sparkling dust from the ever-revolving wheel of life, this fly is the most aerial, most spirit-like, so that when it suspends itself motionless in mid-air before your eyes it is like a fly made of air with the sunlight coming through it. It is, in fact, the highest achievement of Nature in this direction, in the fashioning of a living thing so light and volatile that the down of dandelion or floating gossamer threads seem heavy in comparison.

The whole life of this fly, as a fly, is passed in a perpetual joyous game, or rather dance, with little intervals for rest and refreshment; a miraculous dance in which it suspends itself, still as a stonefly suspended in the air, then suddenly vanishes to describe a hundred fantastic figures in its flight, like a skater figure-skating on the ice, with such velocity as to be now invisible and now seen as a faint shadowy line by the onlooker.

It has the habit, like that of the humming-bird, of darting close to your face and remaining motionless in the air for some time, and when thus suspended close to your face you are able to hear and appreciate the sounds it emits—the fine clear musical note and its changes. I cannot but believe at such times that its wing-music is as much to the insect itself as are its brilliant fantastic motions; that if the fly could be magnified to the size of, let us say, a humming-bird, and the sound it produced increased in the same degree and made audible to us, we should find the music an appropriate and an essential part of the performance.

Nor do I believe that this joy is confined to the dipterous insects: I would say that all flying insects receive pleasure from the sounds they emit, even as do the non-flyers that make their music on trees or on the ground, or even under it, like the mole cricket; I would, in fact, include all wing-made sounds, from the inaudible pipe of the dancing midge to the drowsy hum of honey-bees and the booming of the big carpenter and bumble-bees; the dry-leaf buzzing of wasps; the sharp silky rustle of dragon-flies and the drone of beetles, such as that of our own stag-beetle that swings by at eventide with a sound like that of an aeroplane in the clouds.

Birds, we have seen, do not shine as instrumentalists; the wonder is that, shaped as they are, they have been able to produce any music other than vocal, and by music I mean sound for its own sake. We may suppose that their inability to produce sound in any other way owing to their conformation has only served to make them more vocal, so that their voices exceed those of all other creatures, human or animal, in power and brilliance and purity and all lovely qualities, if we except the sounds which are lovelier to us because of their expression, or, in other words, because they are human and ours. Nevertheless, some species have succeeded in producing instrumental sounds, and in a few the sound is made with the beak alone. Thus, the storks rattle their long powerful horny beaks to express quite a variety of emotions—alarm and anger, or as a challenge or threat to an enemy; they also rattle greetings to their friends, and again rattle to express a happy or contented frame of mind. The rattling then becomes a sort of rude music, less elaborate but in character similar to the teeth-gnashing musical performances of my friend the Basque described in a former chapter.

Many other birds—the owls are an example—snap their beaks, but this sound, so far as I know, is solely an expression of anger.

In the woodpeckers the beak is used as a stick to drum on wood, and this drumming is a wonderful accomplishment. I have watched all our three species of woodpeckers in England when drumming scores of times, and even when near and with my binocular on the bird it was hard to see that the head moved at all, it moved with such celerity, rocking from side to side, apparently delivering the blows on the wood with the sides of the beak. If I drum with a vulcanite or metal pencil or pen on a branch as hard and as rapidly as I am able, the sound would not carry twenty yards, whereas I can hear the green woodpecker drumming with his much smaller pencil and the small power in his neck muscles not less than a quarter of a mile away. He also has the power to modify the sound and use it to express different moods and emotions. It is a call to inform his mate of his whereabouts; it is also a love call; also a challenge to a rival or intruder on his domain; and he also indulges in it at intervals solely for its own sake—for the pleasure the sound gives him—and it is then a sort of instrumental music.

But almost all bird sounds that are not vocal are made with the wings—chiefly with the hard stiff quills, or flight feathers. Thus, some gallinaceous species trail their hard feathers and produce a scraping sound when performing their dances. In other species there are wing-slappings and clappings. The slapping performance is remarkable in one species I am familiar with—the widgeon of South America. Like its European relation, it is a loquacious bird with a fine voice—whistles and trills. It has the habit of rising in small companies of five or six to a dozen birds to an immense height, not circling upwards, but climbing the air like a skylark, until it is so far up as to appear like a floating black speck in the sky. At that great altitude it will remain hovering for an hour, uttering its various vocal sounds, the birds keeping a yard or so apart; but at intervals they close in a bunch and with their wings strike resounding blows on the wings of those nearest to them, and even when the birds are no longer visible the sound is heard like hand-clappings in the sky.

The best example of wing-clapping is that of our common nightjar, and is most interesting in localities where the bird is abundant, when half a dozen to a dozen or more meet of an evening to wheel about like a company of playful swallows—a sort of wild aerial dance with the accompaniment of various strange cries and wing-clappings. Doubtless long practice has greatly modified the structure of the wing joints, so that the bird is able to smite his wings together over his back with such violence as to produce a sound as loud as a hand-clap.

It is a very rough and primitive sort of music, but in the snipe — the "goat of heaven" — the feathers have been modified to produce a more elaborate kind of music—a filing or scraping sound in some species and a tremulous bleating sound in others. These are so like vocal sounds that one does not wonder that the controversy as to whether they were vocal or instrumental lasted quite a hundred years in England.

One is not certain as to how the curious grunting followed by shrill glass-shattering sounds emitted by the woodcock when roding, as its aerial love-performance is called, are produced. To my ear they are like a combination of the two kinds of sound.

Sound of some kind is produced by the wings in flying in most birds, the notable exception being the owls that have softened feathers; and it is from the involuntary sounds—creaking, humming and whistling—that whatever wing-music exists has been evolved. There is reason to believe that the birds themselves have as much enjoyment in it as in their vocal exercises. We see this in the snipe, that makes the most of its feather-sounding powers in its downward rushes, with the feathers set at the right angle. Also in all those birds that produce horn-blowing sounds with their wings. I have heard these from birds of widely different orders—hawks, shore birds and others. It is also probable, in all those song-birds, like the pipits, that have the habit of rising high in the air to come down like a parachute, the wings pressed to the sides with the flight feathers thrust out at a sharp angle, that the wing-music as it descends singing is to the bird itself an essential part of the performance.

Pigeons make a distinct musical sound with their wings when gliding, and one cannot but think that they glide for the pleasure they have in the sound. Again, there are numberless species that produce when flying a more or less musical humming sound, continuous or intermittent in those that have a rising and falling flight, and this too I believe is a pleasure to the birds, and that they spend much time on the wing for the sake of it.

In this chapter I have dealt briefly with an extensive subject, but a great array of facts, which may be found in scores of books, were not needed to enable the reader to see what I mean: I give but few facts, and those mostly gathered by myself in the field. The larger part of the subject, or at all events that part of it which seems most interesting to us as human beings—instrumental music in man—remains to be treated in the next chapter.

XVIII

Instrumental music and its evolution—A book that is wanted—Fashion, caprice and selection—The piano made perfect—The quality most desired in musical sound—A bird and insect illustration—Naturalness of instrumental music—A bird-voice and the power of expression—Human expression of instrumental music—The harp—Obsolete and reigning instruments—A first experience of great music—Cause of different effects produced by bird and human music—Conclusion.

COMING to the subject of instrumental music in man, I consider it fortunate that I know absolutely nothing of music as an art—as music presents itself to the informed and the adept. I know, that is to say, just as much about it as is known to the vast majority of the inhabitants of this country, who never had a music lesson and are unable to read a note; who hear no music in their homes nor anywhere except in a church or chapel or concert-room, if they ever go to such places, or when they by chance hear a brass band in the street.

It was but yesterday that a lady, getting up from her seat at the piano and sweeping round upon me like a queen of tragedy, exclaimed: "But you don't understand! You can't know what music is to me! It is my life!"

And that is precisely why I am pleased to think I am not a musical person, since if I were that it would disqualify me from treating such a subject in a way proper to this book, that is to say, as a naturalist, from the evolutionary point of view, as I have already treated the instrumental music of birds, beasts, batrachians, and insects.

I understand the lady's attitude only too well, alas! and I shut my eyes as tight as I can just not to see the Lamia or Lilith, or by whatever name we like to name this too fascinatingly beautiful serpent who steals into our heart and clouds and mocks our understanding.

It is unnecessary here to hark back to the origin of such music in man—its small pitiful beginnings, which are alike in man and the lower animals—in both a result of the impulse and desire to make a sound for its own sake. It remains to speak of it as we find it in its actual state of development.

We have noted a great difference in the instrumental music of the West and East; that in the former this music has been progressive for many centuries, while in the latter it appears to be non-progressive, also that the instruments it retains and values are the same as or resemble those which were also ours in a lower stage of music culture, and have long been discarded.

It strikes me as a great want in our literature of music that we have no comprehensive work on this development of European instrumental music. There exists in our musical histories and dictionaries an enormous amount of material for such a work. It is a subject which could not fail to inspire and hold the interest of any student of music who should undertake it. Such a book would appeal to a very large public, which would not be of music-lovers only, but would include all who are interested (and who is not?) in the history of our race and civilisation from the point of view of evolution.

No doubt there is fashion in instruments as in many other things. Have the old instruments been cast aside merely from caprice, or because others were invented or improved and become the fashion, just as in the case of lap-dogs, which ladies keep to fondle in their drawing-rooms, one sees a pug or griffon in favour one day and cast off the next for a Pekinese? The effect of fashion and caprice cannot be wholly excluded, but the main cause of all changes has been a principle of selection, of accumulating improvements, deliberately sought or hit upon by chance. Thus, we know how it has been with the pianoforte. We hardly want our musical masters to tell us, when we listen to performances on the virginal, spinet and harpsichord, that it was the thinness of the music of these and of the instruments which preceded and were their prototypes—psaltery, dulcimer, monochord, etc.—which acted as a perpetual prick to inventive musical minds—a sense of dissatisfaction which was in itself prophetic of a fuller, deeper, richer music. The better in due time came to be: thus, we have the pianoforte of to-day, and it is inconceivable that there should be any further improvement in it, since any advance, any change, would simply mean its transformation into a different instrument.

The evolution of the piano has not, however, proceeded on identical lines with that of other instruments, wind and string. Thus, the chief value of the piano is as an accompaniment to the voice, to assist and strengthen it, to form a background to it and give it a richness it would not otherwise have. It serves a similar purpose in orchestral music, albeit as a background to violin, 'cello, and other orchestral instruments, it has less value.

In listening to a great performer I may be so charmed, so carried away, as to think the piano the supreme instrument; yet when it is over I go away with a sense of something wanting: it has not wholly satisfied me: after all it is not the supreme instrument. That which I most desire in music, which most delights me, is a quality wanting in the piano, or not possessed in the same degree as I find in other instruments. This quality, this charm, is in the *expression*, by which I mean the human associations of the sound. And as it is with man so it is with all sound-producing beings, from the highest vertebrate to the insect. Each has its own specific associations, its recognition of a special sound, the meaning of the memories it invokes.

Here is an illustration. I had as a visitor to my window in London a woodpigeon who came every day to devour any food it found on the tray kept there for the birds. It was an excessively shy pigeon, and as long as I remained in the room, even with the window closed, it would stand motionless watching me suspiciously, and at any movement I made it would rush off and not return for several hours. Probably someone had attempted its capture, so that it looked on all of us who have the human form as dangerous beings. This uncomfortable state of things lasted for over a year; then one day it occurred to me to mimic the cooing of a woodpigeon: this instantly attracted its attention, and from that moment it began to lose its suspicion and allowed me to go to the window and watch it feeding; then, in a short time, it actually began coming into the room to feed on the table.

Again, take the case of the great green grasshopper, the most musical of our insects. You may try him with a variety of sounds, and whistle and sing your sweetest and play the flute or fiddle and he will pay no attention; but try him with a zither, running a finger-nail over the strings, and instantly he is all attention, listening and moving his long antennæ about, and presently he will start playing on *his* zither in response to yours.

You have come down to his world, his species, and touched a chord in his grasshopper heart. And as with grasshoppers so it is with man. We are interested above all things in ourselves; in the sound that touches a chord in us, and the chord may be touched by instrument or voice. They are, so far as expression goes, one and the same, and the closer we look at them the more indivisible they seem. When Izaak Walton praises the sweet music the nightingale makes with "his little instrumental throat" he is stating a literal truth: the bird's singing organ is an instrument of music, only he carries it within his body instead of attached to his exterior like that of locust and cricket. One recalls Samuel Butler's notion concerning machinery; how that the machine is an extension of or an addition to our own organs, a growth as it were, which has come about just as the organs themselves have come in response to a need, a desire. That is how it is with the locust's instrument; and even as his came to the locust so have our instruments come to us and are more like natural growths than any machine. One emanates from the brain, the other from heart and brain, and this last is to man like the flower to the plant. How like it when we trace back the evolutionary history of the one and the other; from the first small inconspicuous beginnings of the flower to the marvellous result—the perfection in form and colour and fragrance! And the instruments of sound, that have gathered into themselves all the emotions of our lives and return them to us transformed to something inexpressibly beautiful!

To return to the subject of bird-music and the expression in some of it which constitutes its principal charm—the human note or quality refined and brightened. We recognise it in several of our common species, the barn or chimney swallow, for example, the pied wagtail, the willow wren, the blackcap, the rock dove, stock dove and ring dove, the wood owl, the cuckoo and, best of all perhaps, in the blackbird. John Davidson, the poet, spoke of the "blackbirds with their oboe voices," and we usually describe their strains as fluting: and flute and oboe are sister voices in the choir.

We may then imagine and look at birds as musical instruments, which we ourselves invented, which acquired from our hands and breath a life of their own and wings to fly with; and now in their independent lives they have made a music of their own but retain, mingled with it, some of the old remembered sounds.

Here I cannot resist the temptation of recalling an old memory, an incident of my youth on the pampas, for not only is it a story which I think worth relating, but it is the best example I have ever met with of the power of association a bird sound may have. Such associations are never felt more than in lonely desert places, especially when we are alone with a savage or unhumanised nature which brings the latent animism in us to life.

I was at a dance in a gaucho's house, and going into a small room adjoining the big living-room where the dancing was in progress I found a dozen or fourteen men, all gauchos, engaged in a hot argument as to which life was best for a man—that of the frontier and desert, or that of the settled districts, where there was safety and human companionship. Some held that the life of adventure and danger on the frontier was the best for a man, as it taught him to rely on himself for everything and brought out all the latent power and cunning in him. It made him quick to see danger, to fly in time or to strike before being struck: to be prepared against all emergencies, and above everything to take proper care of his horses. It made him a man, a *gaucho*—proud of his skill and strength. There was a savour in that life which satisfied him above all others.

Then followed the speech from the other side which so impressed me, from a man I knew, named Bruno Lopez. He was a middle-aged man, a gambler and fighter and something of a ruffian; but in spite of his faults there was that in him which made people like him; when not in a quarrelsome mood he was very genial, and took everyone into his heart.

He said he knew what the life of the frontier and the desert was, none better, since he had spent years as a frontiersman, also on several occasions he had been a fugitive from justice in the desert on account of some accident or misfortune which had befallen him. But he was never happy there. He was contented enough when on horseback from morning to night, or when doing something, also he could endure cold and hunger and thirst and fatigue as well as any man. But when his active day was finished, when he was alone in the desert under the sky, or in a hovel on the plains, and there was no one with him, no friend, no woman or child, he felt the loneliness. He felt it most when the sun went down, and a shadow came over all the earth; when he looked to this side and to that, and as far as he could see it was all a waste of tall grasses where there was no thatched roof, no smoke rising from any hearth; and then at that moment, the sun going down, the big partridge called from the grass and another bird answered the call, then another, until from all over the plain came the sound of their calling. What was it in the voice of that bird that made his heart so heavy, that there were times when he felt he could cast himself face down on the ground and cry like a woman? Was it that the voice told him he was alone on the earth?

The bird he spoke of was the rufous tinamu, called *perdiz grande* (big partridge) in the vernacular, on account of its superficial resemblance in colour and shape to the partridge; a bird the size of a fowl with a very beautiful voice, its evening call being composed of two long clear notes followed by a trisyllabic note, or a phrase of three notes strongly accented on the first, with the human contralto-like quality which gave it the beautiful expression.

It was, I take it, this character of the sound which touched a chord in him and gave him that divine despair, and made the tears rise in his heart; his words, in fact, were almost those of the poet when he says of such tears, "I know not what they mean."

It had seemed to me that he was talking poetry, but he spoilt the effect when, in conclusion of his argument, he threw his head back, and pursing out his lips attempted to give us a whistled imitation of the bird's evening song. It was a ludicrous failure, and made us laugh. But it was not wanted; his words had brought back to our minds a memory, an image, of that voice of the desert, since we were all familiar with it although the bird was not to be met short of two hundred or more miles from where we were spending the night in the settled country. For this tinamu with a beautiful voice vanishes when cattle and their masters come to eat down the tall grasses and kill the birds for the pot. It is essentially a bird of the desert pampas, on which account the gaucho setting out for the frontier tells you he is going to the plains "where the partridge sings."

No more need be said on this subject of the value that natural sounds and particularly bird voices have for us as human beings. It is precisely this element, the human expression, which gives its chief attraction to instrumental music. Herbert Spencer was not quite right in saying that *all* music is an idealisation of human emotions. We have seen that music for him was almost exclusively vocal music, or at all events that he hardly touches on instrumental music when dealing with this subject. There is instrumental music devoid of expression that we cherish or tolerate solely because it is an intrinsically pleasing sound and tickles our hearing. And going back in time we find that it is precisely the instruments of this character which have successively lost their attraction and been discarded. Nevertheless, the element of caprice and fashion cannot be excluded. I cannot, for instance, see any other reason for the retention of such an instrument as the piccolo, which in solo-playing may tickle even a modern's ear with its million fantastic flourishes, as of a superior singing mouse or a squealing piglet of genius, but in orchestral music is distinctly offensive. Caprice, then, has served to retard progress, although probably much more in home or domestic than in orchestral music performed in public. Thus we find that an instrument beautiful to our ears, and with the quality of expression which should make it dear to our hearts, may yet lose favour. The harp is an example: and in this case it may be said that it was ousted from the house by the piano, a bigger, louder, more varied instrument; an important-looking piece of furniture for a drawing-room; moreover, an instrument that any daughter of the house, however stupid or unmusical she might be, could be taught to strum on after a fashion. Again, we see that in orchestral music the harp has become almost negligible, and for a good reason, since that which is best in it, its delicate and tender expression, is lost in sounds that express more to us, greater emotions, and have a more violent appeal.

We may say then that the piano superseded the harp because it was more suitable for everyone, including the coarser-minded and stumpy-fingered, whereas the harp called for special qualities in the player which are not common, certainly not universal—refinement and what was once called sensibility, and above all spirituality. May we not go even further and believe that such an instrument in the house, with such a history—it is really "older than history" and after a thousand changes was brought down but a little over a century ago to its present state of exquisite perfection—may we not believe that the music of such an instrument, with the sight of its beautiful shape, has a reflex effect on player and listeners to make them better than they were made? I speak of it here solely as a home instrument, not as a voice lost in the tumult of mightier orchestral voices.

To return. If we listen to the thin tinkling sounds of the instruments which are now practically obsolete, seeing that those who are still able to perform on them are but a few enthusiasts, we can yet understand why they have had a great past and that they were once as near and dear to those who listened to them as the very voices of their loved ones. For they do still keep something of their ancient charm, especially the clavicord, and we have to say of them, as of many other things, "The beautiful has vanished and returns not." At the same time we cannot but know the cause of their going; that they cannot make the same appeal to us as to our forbears because we have something better—instruments with a stronger human expression. But those sounds that have the greatest charm on this account are not and must not be like vocal sounds. They are like an echo of vocal music; an echo which is not precise —an echo, but like voices of spirits that hear us and take up and reproduce our singing; and in it we recognise ourselves, all our deepest emotions, purified, brightened, spiritualised; earthly passions recollected in regions beyond the earth.

The instruments which have this quality in the highest degree are undoubtedly the violin, the 'cello and double bass, the flute and the oboes, the clarionet, the trombone, the bassoon: these with others in a less degree give us the fullest satisfaction, their value varying according to the degree of expression they are capable of. It is always the human voice spiritualised and made unearthly; and no sooner does it rise or, rather, degenerate into a too close resemblance to the human voice (or any other natural sound) than it repels us: we feel this in what is called the *vox humana* of the organ. I have also felt it where in an otherwise beautiful piece, descriptive of spring, an exact imitation of the cuckoo's or the nightingale's song has been introduced. The least touch of what may be called realism in music is fatal to its charm and its mystery.

Listening to great music my feet are off the ground. I float away as in the dream called levitation and am in another realm far removed from earth, inhabited by beings who were once of the earth. I hear them, a great company, coming towards me, singing and chanting as they come, and recognise in their clarified and infinitely beautiful voices the voices that were once of earth, and in their singings hear their memories of the earth.

These feelings which music invoke in me serve to remind me of my first experience of great orchestral music. My musical readers accustomed to haunt the Queen's Hall and such places may smile at what I call my *great* music, but it came to me as a revelation as if, even I, a little boy from the wilds, had been snatched up and borne away into some unearthly region. The music I had so far heard was of the guitar, an instrument to be found in every native ranch or hovel. There were six or seven kept at my home, so that each of us children could have one to play with or play on if he could learn how. No other instrument was ever heard, except a trumpet, when by chance a troop of soldiers in their scarlet uniforms came our way, or the sound of a horn blown by the driver of a diligence. The *great* music first came to me when I was taken on one of our annual visits to Buenos Ayres city. There I saw troops reviewed in the chief plaza and heard the military bands. Then I discovered the cathedral and its orchestral music, for there was no organ. Coming into this great building on a great saint's day, I heard for the first time the wonderful sounds. They came from above, and entranced and drawn by such sounds, although I was as shy as any little wild animal, I crept up three or four flights of broad stairs to find myself at length in the gallery itself, where a dozen or fourteen men were performing on "instruments of unknown forms." There I remained during the whole performance, listening, absorbed, entranced, lifted out of myself, trembling with an excess of delight such as I had never before experienced. For that joy I had to pay pretty dearly, since the music haunted me afterwards day and night for weeks, until it became a torment, at first a delicious pain, but eventually almost pure pain.

This troubled me a great deal; for even after the pain had gone I continued to remember and think about it; and as others I spoke to on the subject appeared not to have suffered in the same way I began to fear that I was "peculiar"—that there was something wrong with my nerves. Then, at long last, when in my teens I first read Gilbert White's *Selborne*, I came on a passage which exactly described my own sensations and it was a comfort to me since I knew now that others had felt about music as I did, and had not gone out of their minds. The passage occurs in a letter to Daines Barrington:

> You that understand both the theory and practical part of music may best inform us why harmony or melody should so strongly affect some men, as it were by recollection, for days after a concert is over. What I mean the following passage will explain: "He preferred the music of birds to vocal and instrumental harmony, not that he did not take pleasure in any other, but because the other left in the mind some constant agitation, disturbing the sleep and the attention; whilst the several varieties of sound and concord go and return through the imagination: whereas no such effect can be produced by the modulation of birds because, as they are not equally imitable by us, they cannot equally excite the internal faculty." (Gassendi, in his *Life of Peiresc.*)
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> This curious quotation strikes me much by so well representing my own case, and by describing what I have so often felt, but never could so well express. When I hear fine music I am haunted with passages therefrom, night and day: and especially at first waking, which, by their importunity, give me more uneasiness than pleasure: elegant lessons still tease my imagination, and recur irresistibly to my recollection at seasons, and even when I am desirous of thinking of more serious matters.

The only comment to be made on Gilbert White's comment is that if he had given a moment's thought to the subject he would have seen how far from the truth, how absurd even, was the explanation which he accepts unquestioning because it was Gassendi's. Great music does not continue to haunt my mind after hearing it, because it is imitable, and I am resolved as soon as I can pull myself together to imitate it and am furiously excited about it. And as to bird music, it doesn't haunt me not because it is inimitable, and I am not such a fool as to imagine it is, consequently I just enjoy it and think no more about it.

The true explanation of the haunting effect has already been given by anticipation in this chapter. The continued agitation is due to the expression in music which affects us in different degrees. And I take it that we are far more powerfully affected by orchestral music than by vocal, because singing is wholly, purely human and is ours, but instrumental music is not ours in the same way: it is ours, as I have said, but clarified, beautified, spiritualised beyond the range of the human voice, and the expression is consequently intensified.

Lest this should not appear obvious I will state it in other words: the effect is intensified for the very reason that it is not wholly human—wholly of the earth, like our own voices; but is reminiscent of the earth and our earthly lives. It stirs us more than the voice because it *is* the voice, clarified, beautified, coming to us from otherwhere; and the effect is thus similar to that of any human-like sound or tone, in itself beautiful, heard in solitude or in a lonely desert place; or, to give a concrete instance, like the contralto sound in the modulated evening call of the tinamu, which made the tears gather in the heart and rise to the eyes of my friend the gaucho.

Passages from other writers could be quoted on this point and I will only quote one, perhaps the most remarkable, from Rousseau's *Nouvelle Héloïse*:

> But when, after a succession of agreeable airs, came those vast bursts of inspiration which arouse, and which depict, the turbulence of mighty passions, I lost in a moment all idea of music, of imitation, of song: I seemed to hear voices of grief, of transport, of despair: I seemed to gaze on weeping mothers, on forsaken lovers, on fierce kings: and in the agitation of my mind it was only by strenuous effort that I refrained from leaping to my feet.
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> Such impressions never *can* be felt by halves; either they are violent to excess, or they are nothing; poor, weak, or limited they cannot be; either the mind remains insensible, or it breaks all bounds. For music is either the vain and empty babble of an unknown tongue, or else a vast tempestuousness of passion which sweeps away the soul.

It is true that music is a "vast tempestuousness"—to some of us, to those in fact who feel that it is so, seeing that we are not all susceptible in the same degree. The whole passage is true in a sense as conveying the feelings experienced to a reader. But Rousseau was a literary person, an artist in words, and not a naturalist bound to the literal truth, and when in order to get his effect it was necessary to invent, he invented. Thus his vision of weeping mothers, forsaken lovers, and fierce kings, was all an after-thought: all put in for the sake of the colour. For there is this about music and its "vast tempestuousness"; the *expression* due to its human associations, without which it would tickle our ears but not touch our hearts, is not a recollection of vanished scenes and faces, or of anything definite, anything imaged by the mind—the passions that have swayed the soul on particular occasions and long-past states of happiness and misery; it is the *feeling* that all these events and passions have left in the mind, even after the actual facts, the cause of the associations, have been forgotten. The feeling creates the expression, and as every individual life differs in its emotional experiences and the subsequent associations from every other life, the expression which each one of us finds in music, and in whatever he sees and hears, is his own and differs from that of others.

To return to my own experiences. In time, when I had more and a fuller experience of music, vocal and instrumental, in concert halls and operas, the agitation grew less and less until after years I could listen and take my pleasure without any painful after effects. Something of the original disturbing power in music remains, when, for instance, I have listened to a great symphony or a great opera and am haunted for days by a persistent recurrence of certain passages; but it is no longer a pain. Or, if a pain, it is a pain one would not willingly forgo.

In conclusion of this chapter I am concerned to think that the musical reader may have misunderstood the words used at the outset, when, after confessing to my ignorance of music, I stated that the subject would be instrumental music as it exists. The chapter itself will serve to show that it was never my intention to deal with music as an art and a science, but to regard it solely from the evolutionary point of view as an outcome of life, as natural as singing—to treat of its development, of the qualities which were most prized in it and of the consequent changes that have come about in the construction of instruments, and the successive improvements in those which possessed the desired quality in the highest degree and the elimination of others which were without it. I have not then gone beyond my last, the modest ambition of a field naturalist to see the things that lie on the surface. It is for the biologist to seek for pearls in the deep waters; for me to keep to the safe shallows where the children paddle, and the wet sands at low tide where I can gather my little harvest—my ribbons of seaweed and a few painted shells.

CONCLUSIONS

Difficulty of ending a story without end—Art as universal instinct—Plastic art tracked by a footprint—Primitive expression of the colour-sense—And of the actor's and story-teller's arts—Santayana criticised—Insignificance of art in relation to life—An image of a cloudy sky—The cry that calls attention to something seen—An everlasting aspiration—The artist's creed—A way to something better—The author's credentials—" Unemotional music " and the ordinary man—A picture seen in boyhood—Sense of beauty a universal possession—Definition of " field naturalist "—The perpetual flux of artistic theory, a sign of progress beyond art—An unanswered question.

THIS being a story without an end, I have known all along that there could be no proper coming down with the usual bird-like slide and glide and the light touch of the dropped feet on its native earth. A bump instead, and an uncomfortable tumble to the ground. One revolts against such a termination, and no sooner have I put the pen down than I pick it up again to add something that might, or ought to be said, and, incidentally, to soften the fall. My trouble in making this conclusion is that I have been drifting away from the Hind in Richmond Park, with her trumpet ears, and from the animal mind which was my support. It is clear that I should have to drift further away still, even into speculative matters which are dangerous; that to go on in the way I have been doing, obedient to the "suggestion of contiguity," the subject of the last chapter would have to be continued, and to follow that of art generally and its meaning. Not art as the artist sees it, but art as seen from the outside, as an impulse, an instinct, as sense, in all of us. For albeit we use the word in a metaphorical sense when we speak of the sense of beauty, it is in reality a sense, a subject as proper to the field naturalist as the senses of smell, of direction and of polarity and migration. But to treat it fully as it appears to my mind, would take me far beyond the limits set to this book, and the most I can now do is to indicate as briefly as may be the line the argument would follow. It concerns the meaning of art, as I have said, from the evolutionary naturalist's point of view, founded mainly on observation of one's own feelings and experience.

Thus, to go back to music: certain sounds attract and please us on account of their intrinsic beauty and novelty: by-and-by they draw to themselves or become mixed with associations, some the result of personal experience, others probably inherited, and the feeling they produce in us is confounded with the desire to express it in just that way—in sounds. Sound is but one thing that makes this kind of appeal to us. Thus, the child that goes bare-footed over the smooth wet sands looks at the perfect impression left by its foot, and is pleased at the sight, and has even a dawning sense of creative power, and eventually this feeling and idea leads to creation. In

Patagonia I found in some fragments of ancient primitive pottery of baked clay an ornamentation made by pressing the finger-tips with the curved nails on the moist clay; then I found other fragments partly decorated symmetrically with small rhomboidal marks, and this decoration had been made by pressing the segmented shell of the armadillo on the clay before baking. This, I should say, was the first conscious step taken in the direction of plastic art after the involuntary print of a foot on the wet sand had stirred the sense of beauty and the creative instinct.

This extremely primitive artistic effort of the ancient Patagonians represents a stage of culture very far below that of the cavemen in Europe with their graphic pictures of wild animals incised on rock and bone. But we can see all the early stages in our own young barbarians playing in a mud-puddle, progressing from printing a foot with all its little toes complete to the moulding of "mud-pies," and so on till the period of drawing human figures on a slate—an O with two eye-dots for its head; a straight and broadened line for the body, with two lines below for legs and two above for arms. And that is how the human form is represented by the Greenlanders and Samoyedes. The grey Samoyede and the five-year-old civilised child are mentally on a level in art, while both in a sense are contemporaries of the Patagonian savage of a thousand years ago, and they are very much older than the cavemen of Europe who probably perished of cold during the glacial epoch.

Again, when observing little children out in search of wild fruit, first the children of Patagonian savages and later English village children, I have seen them laughing with pleasure at the sight of each other stained red and purple, and then deliberately rubbing the coloured juices over their hands and faces.

Thus is the love of colour first expressed in us. In the Patagonian this childish expression is continued to the end of life, and men and women paint their faces black and crimson. But it has not stopped there: it has led them to discover and invent permanent mineral dyes with which they dye the bare side of their skin robes with a minute herring-bone pattern in brilliant yellow, red, black and green colours.

We know how great has been the development in Eastern peoples in this direction, and how perfect their taste, trained for ten thousand years, is in their use of bright colours. This has led a great Englishman to say that Eastern art begins where ours ends—one of the very foolish sayings we are accustomed to receive from our great and wise men. The truth is that most of the art of the East is art arrested, crystallised, in a semi-barbarous state.

Again, we see in children, civilised and savage, from the polar regions to the tropics and all the world over, whenever a few have met together they chatter like starlings and parakeets about the things that interest them—whatever appeals to their sense of fun, of the novel, the grotesque, the beautiful. The little one who mimics his playfellows and elders the best, or gives his relation in the most lucid and impressive manner, excites most laughter and interest in the others: and soon he discovers that he can make the interest greater by exaggerating and inventing. Hence the actor's and the story-teller's arts, and our Homer, Apuleius, Boccaccio, Cervantes, Swift and the regiment of fictionists of the present time.

And thus it is with all the arts: they spring from one root, one impulse, the sense of beauty in any mortal, which is not an overflow of the sexual instinct as some of our philosophers imagine. And if we look closely enough we find it in the animals as well—bird and beast and fish and insect.

Santayana in his *Sense of Beauty* says: "The arts must study their occasions: they must stand modestly aside until they can slip in fitly into the interstices of life." It is well said, but I can't follow him when he describes this sense of beauty and its outcome in its relation to the realities of life as the wild strawberry and other small decorative growths which spring from the crevices of a granite mountain. The mountain represents the realities of life. And he adds: "This" (the insignificant results) "is the consequence of the superficial structure in which they flourish: the roots, we have seen, are not deep in the world, and they appear as only unstable superadded activities and employments of our freedom, after the work of life is done and the terror of it allayed."

This, whether intentional or not, produces the idea that the sense of beauty is a late development of the mind—a superficial structure; whereas the truth is, that the spirit, the sense and the impulse, has its roots very deep in the world and is in all sentient life, and, to follow his metaphor, it is inherent in the granite itself and pervades it like a subtle fire.

Looking at art from the outside, we may say that it is insignificant in relation to the realities of life. To the artist, particularly when he contemplates the immortal works, as he deems them, of the foremost geniuses, it no doubt seems a very great thing—the highest achievement of man. To the mass of humanity it is something unimportant, negligible. The reason is that in the works of art the universal sense of beauty, the fiery principle, a sweetener of life and joy forever, can never find its fullest, freest and its final expression. The artist himself in spite of his delusion will sometimes confess it. Thus, we can imagine a Buonarotti greater than the Michael Angelo we know, who after a sculptured Moses, a painted Last Judgment, a St. Peter's at Rome and a volume of poems, had also excelled in wood carving and in metal and enamel work, and had composed great symphonies and oratorios, and was also a performer on various musical instruments, and had also delighted the world with his acting on the stage, both in comedy and tragedy; who, after doing all these wonderful things, going over them in his mind, had said: "They have all failed to give me perfect satisfaction, though I found a certain pleasure in doing them—just the common instinctive pleasure which the worker takes in his work. But they have not given me the full self-expression I sought for. Nor could they, seeing that the feeling I desired to express was fundamentally one and comprehensive, and earth and all life on earth evoked it; whereas in art it is as if this feeling was many distinct feelings, each occupying a separate compartment in the mind, to be tended like rare and delicate plants in glass frames. Now, after having nursed and brought to flower many of these plants, I think there must be some other and better way—a means of self-expression which I have not found, and to which man has not yet attained."

Or we may change this illustration for another; instead of plants, an evening cloud, a uniform grey low down in the west which at sunset appears to break up into many clouds and cloudlets, floating against larger clouds, showing many different brilliant colours; why should that emotion it is desired to express be concentrated on one particular cloud or cloudlet, its form and colour, when presently, even while we gaze, the brilliant colour will fade and the clouds will reunite in one, and all again a uniform grey? In other words, why should the artist, shut in his studio, concentrate on a block of marble and toil for months with chisel and hammer to bring it into a semblance of a human form and expression, incidentally suppressing or starving all other emotions just in order to overfeed this one? The imaginary discontented artist would say: "O yes, it will serve its purpose and make mankind gasp with astonished admiration for a long time to come; but rather than the statue and picture and all other great works of art would I have (and have all men to have) a simpler, more natural, more spontaneous means of conveying to others that which is in me."

It is not merely by thinking, or speculating, that I myself have come to this conclusion, which my artistic readers will laugh at. It is purely a result of experience, of my private personal feelings about art and the changes which time has brought about in the feeling.

The artist, after having had his laugh, will explain to me that my case is not singular. "You are not an artist," he will say; "your interests, your activities, your pleasures, are in other things—material and mental; the artistic side of your mind has been too long neglected, with the inevitable result that you no longer see or desire to see or even believe in the existence of all that once attracted and charmed you."

This undoubtedly describes a quite common experience—the stockbroker, the racing man and the physiologist afford us three awful examples—only it does not happen to be mine, as I shall endeavour to show presently.

Art, as I regard it (to repeat again what has already been said), is an outcome of that universal sense of beauty—to put it in one word—and the accompanying impulse to impart the emotion experienced to others. This impulse itself, it may be said in passing, has an old history, and begins in animals and man in a cry that calls attention to something seen, which eventually, when the human animal becomes articulate, shapes itself in words: "I see something—come and look at it!" From this invitation to come and look at something seen we rise to the desire of exhibiting—conveying a feeling to others, and in the long result we have art in a multiplicity of forms, each giving a partial, never a full, satisfaction. And it never can, seeing that it is not an end in itself but a means to an end, an everlasting aspiration and striving after something unattainable or not yet attained.

This has doubtless been often said, but it does not fit into the artist's creed. What is his creed—what is the meaning of art to him? I take it that for him there is nothing conceivable beyond art as a means of self-expression, that the utmost he can do is to strive to emulate just what others have been doing for thousands of years—that, in fact, art is an end in itself.

Here I recall the statement of a great painter, a leading post-impressionist, I think he is called, who flourished towards the end of the last century, as given in his *Life and Letters*. He affirmed his belief in immortality, and said that he looked forward to a happy eternity in following his art of landscape-painting in other spheres, since no greater happiness, no higher destiny could be conceived by him.

It is an extreme statement of the feeling of the artist, who is an enthusiast and absorbed in his art; but artists, as a rule, whether they believe in immortality or not, do regard art as the highest achievement of the human mind.

Doubtless there are exceptions, and I find one in a distinguished composer of vocal music, who says that speech is infinitely more beautiful than song. It is a truth known to many who are not musical artists, but it was astonishing to have it from a professor in the art. The one dyer whose hands had not been subdued to the material they worked in.

To return. A means and a way, then, to something better than art, or at all events more satisfying, not only to the artistic-minded person and to those who specialise in some form of art, but to people generally—to everyone. Something, it may be added, which will inevitably come in due time if the world and its human inhabitants continue to exist for a sufficiently long period without the usual periodic set-backs. But such a change could never take the world by violence. And here I recall Sir Arthur Keith's recent speculations about future developments in the human mind, and I would qualify his statement that it is impossible to foresee any coming change, any new factor in the evolution of the brain, which may be imminent, yet will take us by surprise.

Thus, as to art, one would imagine that any changes which may come (and may possibly even now be coming) to our minds as to its meaning, its value and true place in our lives, would come slowly and not to mankind generally. It would be in the West, in races that have developed the restless, inquisitive, progressive mind, while the East would remain unaffected. There have been some new developments during the last few centuries which have not come as a surprise: there were but a few men in the sixteenth and seventeenth centuries able to foresee the value that science would have a couple of centuries later, and it may be there are few among us to-day who can foresee or even imagine any great coming change in the estimate in which art is now held. But there will be no surprise. Three generations—a short hundred years—is time enough to accustom men to anything new in their lives. It is not yet a century since the doctrine of evolution was accepted by the leading thinkers of Europe.

Just at present there is a mighty turmoil in the artistic world—mainly in painting and music. Fierce revolts against the art of the past—the old everlasting standards and conventions as the revolters call them; new schools and societies and groups of artists are occupied in doing the old things in new ways. But unless this ferment can be taken as a sign that artists themselves are beginning to feel the unsatisfactoriness of art, and in their subconscious minds are becoming antagonistic to it (which is hardly credible), it is all nothing, and the new movements that "come like shadows, so depart," are not worth mention in an inquiry of this kind.

If there are any signs of a change, they are in the minds of those who are outside of the artistic world. And outside of the scientific world as well, seeing that in both cases the reflex effects of their vocation on their minds is to distort the judgment. I refer to those only who are outside of both fields, whose reasoning and æsthetic faculties are balanced, whose interest is in the whole of life, and who have succeeded in preserving perfect independence of mind in a herd where those who have captured the first places dominate the others, and impose their perverted judgments on them.[1]

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And now I cannot go back to the hind and its senses: I must therefore continue with music and subjects which rise by the suggestion of contiguity, such as what art is, what it means to us, what it does for us, what place it occupies in life. But what are my credentials? What can I say in justification of what I write? I confess, at starting, that I am as ignorant of art in general as I have confessed to be of music; nevertheless I am not just an unqualified critic. My credentials are those of a field naturalist who has observed men: all their actions and their mentality. But chiefly himself, for to know others a man must first know himself. The psychologist has nothing but his own mental powers to build on. He is not a field naturalist; his field is not in the whole wide world, but in his brain and all that goes on in it; his wishes, instincts, emotions, thoughts.

I take it that the only persons capable of seeing things as they are in their right relations and proportions are those who have no profession and no vocation or calling, which, when followed with enthusiasm, absorbs their attention. One, let us say, untied, unconfined in a groove, free and appreciating his freedom, intensely interested in life in all its aspects and manifestations, not in human life only, but in all life. His teaching should then be of the greatest value in such a question as this. Above all things he must be one who judges for himself. I also take it that there are many men of this kind who are quite free, perfectly emancipated, and are, perhaps, at the same time, prudently reticent. This reticence, however, it not for me, and I have actually found others of a like mind with mine who are not afraid to let their thoughts be known to anyone.

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[1] What follows was left unarranged by the author. (See Prefatory Note, p. vii.)

It is the range of the observer which trains the senses and the brain. The danger is that he may take one branch of life and give all his attention to that. To specialise is to lose your soul. To speculate is to love your own soul. It might be said again by my imaginary critic that too much may lead to the development of the reasoning faculties at the expense of the æsthetic, that this may decay, and that in any case it becomes less and less as we grow old. I can say that in my case the exact contrary is the truth, since it is not continued interest in phenomena, but the continued growth in strength of the æsthetic faculty which produces decay of interest in art generally, though I cannot say in all art, music and poetry still being exceptions.

There is a modern orchestral music which is said to be not emotional, but a recent higher development of the art. This is a matter which has no place here, since I am concerned solely with the origin of music (in frogs and other creatures as well as man) and its evolution till it has risen to be an art; and as it is the outcome and beautified expression of emotion, "unemotional music" sounds like a contradiction in terms, and one asks for a better term which is not merely a negative to describe it by. For "unemotional music" simply means demusicalised or castrated music. The average or ordinary person for whom I write, being myself one of his kind, cannot go into these higher developments of the art. Thus, music to me means just what music meant to my great-grandfather and mother, and to all men, before and after them. Like Sir Thomas Browne, I am so sensitive to it that I may be moved to tears by even the common and tavern sort of music. It is so with many of us, only we don't say so: but Sir Thomas Browne could afford to give himself away freely, simply because he could do it in words of such charm, and with so godlike a gesture, that the sophisticated and the simple both feared to laugh at him lest their laugh should be taken for that of fools.

What the effect of music was in my early years I have told. It was the same with the other arts, and I will give just one instance—the effect of a painting when I was a big boy, when I first saw a big landscape. It was exhibited as the work of a young Anglo-Argentine artist who had gone to Europe to study art, and on his return had painted this large landscape, a scene in the wide open pampas, with a pool and reeds and rushes, and a group of wild horses on its edge in the foreground. This expression of the world I lived in so enchanted me, that life without the power which such art confers on its followers seemed hardly life at all. The effect of this picture of a scene familiar to me was more powerful than I can describe in words. To be a painter of landscape was my thought, all day and every day. It seemed that what I had to do was to express all that was in me; by this alone life was worth living. It haunted me and was as fierce a pain as I had suffered from when I first heard music.

When Santayana in his *Sense of Beauty* states that it is a small thing in our lives, and its outcome no more than the wild and pretty herbs that root themselves in granite mountains which represent the realities of our nature, I disagree with him and his simile. Beauty is not a casual growth, the result of a seed fallen from goodness knows where into a man's life; it is inherent in the granite itself, and another result from it is the development of a sense and impulse in the whole of life. It is in us all from birth to death—from the ant to the race of men: in the lowest and meanest of us. And it is in the animals, as we see from their games and music. All my long, close observation convinces me that such a sense is well developed in the bird—especially in the crow and parrot families—and in our domestic dog.

It will doubtless be said by anyone who has followed the argument so far that I cannot be free to criticise others on this point, seeing that I have called myself a field naturalist all through this book and, consequently, see like all others through a vocation, a calling, which must soon shadow and distort my outlook in general and make me see things in a wrong perspective. It is not quite so. I have called myself a field naturalist for convenience' sake, and chiefly because I do not exclude the non-human world from my survey. A field naturalist is an observer of everything he sees—from a man to an ant or a plant.

We see that this question of art is in a perpetual state of flux. To go back to the last century: we find that Ruskin was regarded as one of the higher critics of art, and that now his teaching is almost universally rejected; that his theory is all wrong for the young men. We also see that there is a revolt of a host of young artists against the art of all who came before them. We see groups in rebellion against what they call conventional art: the very art one knows in fact. These outbursts occur from time to time and tend to grow more frequent. In a little while they die out, and the generation that follows laughs at their folly. But again others spring up to take their place. Looking back, we see they do not and cannot lift art to a high plane. We see that art cannot progress; that on these lines and in that particular direction it reached its highest level ages ago. But the only explanation of these futile attempts is the sense of dissatisfaction with art generally, which every individual, young or old, with an alert progressive mind comes to in his own life. The revolt against "conventional art," even when it results in something we laugh at, is a sign of progress towards something above the arts, which will satisfy the creative powers, the desire of self-expression.

What then would take the place of art, all the world made in a certain form, if art should die out? How would the sense of beauty, and the desire to express emotion that it creates, be expressed at last? That is a question which directly rises out of the one under consideration, but again it is a new question and the discussion would be a long one, too long for this book, which must now come to an end. No sooner have I finished a book, than I come, rover-like, to hate it: a proper instinct.

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